

And

Improvise Your Own Defence

also

First Aid and Handy Hints for Home Repairs

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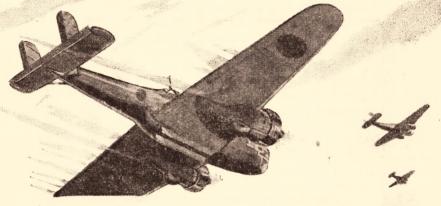
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"May men and women of our Natio devote themselves to the Common Cou-not seeking gain for themselvee, but gi-ing much and taking little; that we we all know the joy of Service and discipline of Self-denial."

Pulteney Grammar School. Wolseley War Workers.

THIS CAN HAPPEN HERE!



KNOW THESE SIGNALS

AND KNOW HOW TO ACT

ACTION WARNING: Long wailing blast, rising and falling, of two minutes' duration, augmented by sharp blasts on whistles by Wardens.

wardens

GAS:

Sounding of Hand Rattles by Wardens.

RAIDERS PASSED: Continuous sounding of Sirens on one note for two minutes.

GAS

Ringing of Hand Bells.
After a gas warning care
must be taken not to enter
gas areas until the "gas
clear" hand bells have
sounded, notwithstanding
that the "Raiders Passed"
may already have been
sounded.

WHAT TO DO

Cut off the gas at the meter.

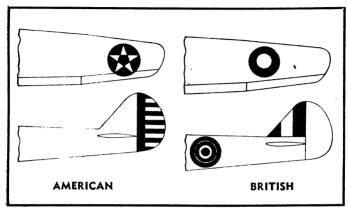
Fill your bath and other receptacles in case of incendiary bombs.

See that tinned food and other supplies are in your gas-proof room or trench.

Go to your shelter as soon as possible.

If you are in the street, take whatever protection is available. (See Page 6.)

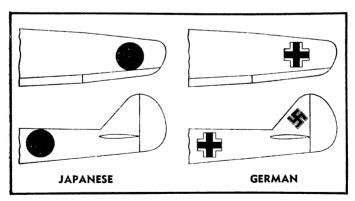
AEROPLANE MARKINGS



Wing—Red Centre, White Star, Blue Outer Circle.

Fusilage—Blue Vertical Stripe, Red & White Horizontal Lines on Tail. Wing—White Inner Circle, Blue Outer Circle.

Fusilage—Red, White & Blue
Circles with Yellow Border,
Red, White & Blue Vertical
Stripes on Tail.



Wing-Plain Red Circle.

Fusilage-Plain Red Circle.

Wing-Black Cross.

Fusilage—Black Cross Swastika on Tail.

with

"KNOW YOUR ENEMY"

AND

IMPROVISE YOUR OWN DEFENCE

This Book has been published in the belief that one of this nature would be of practical value to every house-holder — its purpose being to provide in easily accessible form information on many subjects of present-day interest suitably described and illustrated in such a way as to be of assistance to anyone as the occasion may arise.

ALL

PROFITS ON THIS BOOK
are to be Donated to

BLINDED SOLDIERS AND BLIND WELFARE
in South Australia

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Published by

J V BARTLETT

with the

The Premier of South Australia (the Hon. T. Piayford),

the S.A.
Commissioner of Civil Defence
(Lieut.-Col. G. D. Shaw)

and the
Department of Home Security,
Canberra.

ACKNOWLEDGEMENTS

In presenting this book, the publisher desires to express his appreciation of and thanks to the "Argus," of Melbourne, for permission, so readily given, to reproduce many of the articles shown, and to Mr. David J. Farrell, of Sydney, for the extracts from his book, "First Aid in Pictures," which is, without doubt one of the best available on this subject. To the "Advertiser," Messrs. Charles Moore & Co., and to Messrs. F. H. Faulding & Co. Ltd., we also express our thanks for their co-operation, and to Messrs. Colletype Limited for their assistance in the printing of this book. The articles and information contained in his book are reproduced in all good faith, and are passed on to you in book form for your convenience, but no responsibility can be accepted for any slight error which might creep in or for any later methods which may since have been adopted.

WATCH THE SKIES

Many people throughout the world have been bombed or machine-gunned in the streets by what they took to be "our" planes. It is, of course, a little difficult to recognise enemy planes, and specially the various types, but this is generally through lack of knowledge as to "what to look for" and "where to look" for certain distinctive points.

The main features of aeroplanes are set out on the opposite page, whilst the various types of Japanese planes are shown on the following pages.

The types illustrated have been chosen as the most likely to be encountered in Australia, although those Army planes shown in the latter section are not very likely unless the enemy were able to establish bases in Australia. Each plane is shown in two or three different positions, so as to enable anyone to obtain practice in a subject which may prove to be such a vital one to us, i.e., aircraft recognition.

Our own Australian Army can be aided to a very considerable extent by tens of thousands of additional eyes—the eyes of an observant and in-

additional eyes—the eyes of an observant and intelligent civilian population, and therefore these
notes, kept in a handy
place, might easily prove
of value in some unexpected quarter. In England, the Observer Corps thousands provides Λf people who watch the skies for enemy planes, and even if we in Australia form some such corps, the general public, if educated in important matter, this might still be of immense value.

First consideration should, of course, be the cultiva-tion of an ability to differentiate between enemy aircraft and our own-this should not be difficult because of the number of our own which are continually in the sky. If, however, single planes or formations of aircraft of an unusual type or bearing strange markings are sighted, the information should be conveyed as quickly as possible to the nearest mili-

tary authority or police station. Remember that no information is really better than inaccurate or misleading information. Details of identification are important. The markings of Japanese planes consists of a red circle, as shown on Page 2, but raiding planes may

disguise their markings.

disguise their markings.

Whenever possible, try to obtain the utmost details of suspicious planes, i.e., the number of engines, whether a monoplane or bi-plane, together with other main features as indicated opposite. Convey your information clearly, and notify only those details of which you are certain.

FALSE ALARMS ARE DANGEROUS, but NO ALARM MIGHT BE EVEN MORE DANGEROUS, so wastch the skies—intelligently

watch the skies-intelligently.

IF BOMBS FALL: WHAT WILL YOU DO?

If everything goes according to schedule there will, of course, be a warning as outlined on Page 1, but if there is no warning, and bombs sud-

At home, you may have built your shelter; but, if you are caught away from home, and have given little thought to such a possibility, you may have to "take it," but you CAN avoid "taking it"

have to "take it," but you CAN avoid "taking it" more than is necessary.

If you have no time to reach a proper shelter, throw yourself flat on the ground or dart to the cover of the nearest building or doorway. You stand less than half the risk of injury by lying down than if you remain standing, but, because of possible traffic, do not lie in the middle of the street—the gutter is preferable—and if you get into a doorway, try and select one with no glass door or windows behind it.

If in the country, lie down, preferably against

If in the country, lie down, preferably against a mound of earth, or in a fold in the ground, or anywhere else that provides some sort of shelter.

If you see any signs of unexploded bombs, give them a wide berth, and notify the nearest Wardens' Post by means of a runner (you will not be able to 'phone during a raid).

Common sense will provide a guide, but common sense will not come to your aid if you panic, and will will not panic if you give the matter a little forethought. For further suggestions and casualty comparisons, see overleaf.

AIRCRAFT IDENTIFICATION

The main features by which aircraft can Ine main reatures by which aircraft can be recognised are indicated on the opposite page. Reading from the top, the diagrams represent type, engines, nose, wing outline, rudder fins, wheels, and markings. If these features are correctly observed, and then compared with the silhouettes shown in this book, a good idea can be obtained as to the type of aircraft can be obtained as to the type of aircraft which may be seen.

Example: Plane shown on this Page

Type Midwing Monoplane.

Engines Three. Nose Blunt.

Wing Outline Front tapered, back straight.

Rudder Fins. One. Wheels Floats. Markings Unknown.

MACHINE GUN ATTACK

Attack from the air does not always mean bombs-casualties from machinegun attack in Poland were enormous, and low-flying planes can therefore be a menace.

To hit a person on the ground, aircraft must fly at very low levels.

Remember that aircraft travelling at a speed of 200 m.p.h. can fire 12 bullets a second, and the bullets will hit the ground every 10 yards. Except in acute dive - bombing attacks, bullets will come down at a fairly flat angle.

If possible, take cover indoors—bullets do not usually penetrate brick or stone walls—but keep away from windows.

If caught in the open, do not run. Avoid movement as much as possible. Lie down with your face pressed to the ground, and keep per-fectly still. The whiteness of human faces is the easiest of all targets to see from the air. Never turn your face towards the attacking plane, either by day or night.

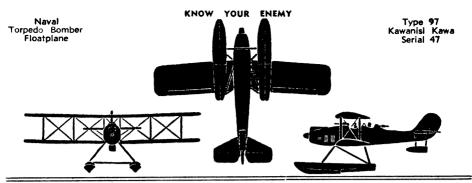
Machine-gunning is most effective against crowds. Avoid congregations of people, and, above all-KEEP STILL.

AIRCRAFT IDENTIFICATION

Specimen characteristics to be noted for identification of Aircraft, whether Allied or Enemy, are given below:

	1	2	3	4	5
TYPE	LOW WING MONOPLANE	HIGH WING MONOPLANE	BIPLANE EQUAL SPAN	BIPLANE SHORTER LOWER	GULL WING
ITPE				_	
	ONE	TWO	THREE	FOUR	SINGLE LIQUID COOLED
ENGINE	-	-			
	BLUNT	ROUND	POINTED	TURRET	BOMBER
NOSE					
WING	BOTH TAPERED	FRONT STAIGHT BACK TAPERED	FRONT TAPERED BACK STRAIGHT	BOTH STRAIGHT	FRONT RAKED
OUTLINE	1	+	4		1
RUDDER	ONE	TWO	THREE	ONE FIN	TWO FINS
FINS	_1_			-	
	VISIBLE	INVISIBLE	FLOATS	BOAT HULL & FLOATS	BOAT HULL
WHEELS		-	1-1	- \$:	
	CROSS	TRIANGLE	SINGLE CIRCLE	DOUBLE CIRCLE	STAR
MARKINGS				0	*

There may be one or two very slight variations of the above, such as "mid-wing monoplane," as shown on the opposite page, but the indications given are practically 100 per cent. representative.



WHAT FIRE BOMBS ARE LIKE

To know how to fight incendiary bombs it is necessary to know what they do. The most common

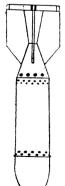
is made principally of magnesium, which burns very fiercely for a few minutes on coming into contact with a hard surface, treating even metals with scant respect. These usually have a small explosive charge added, which is powerful enough to cause injury, its two-fold purpose being to deter firefighting and to spread fires. The explosion occurs usually in from half to two minutes of the bomb falling.

Another type contains oil, or oil and petrol. It causes a quick-burning and widely-spread fire, which can be tackled by the usual methods, i.e., sand or water.

The first of these types burns more fiercely and spits fire farther if water is played on it freely. This class of bomb must be treated with special technique.

It is not possible to lay down hardand-fast rules, because the position in which a bomb lodges, the furnishings of the room, the time the bomb has been burning, and the material available will all have to be considered as fast and soundly as you can think.

You cannot just drop anything on to these bombs, or turn the hose wildly on to them. Understand clearly what the bombs do and how they may be tackled. The information in this book will indicate some of the methods and also how to make handy tools, etc., with which to meet any attack.



Not every incendiary bomb will set fire to a house or building. Some will be deflected by the roof and fall in the garden. If so, shovel dirt on to them, as the flare they cause may attract other bombing planes.

planes.
Incendiaries will pierce a corrugated or tiled roof, and usually the ceiling as well. However, they may lodge in the ceiling, and to be prepared for this you should have a ladder long enough to reach the manhole. Have a look round inside your ceiling in advance so that you will know what parts of the ceiling will not take your weight. Have a look at the position and height of the rafters; they are nasty things to hit your head on in the dark. Remember where you can stand upright and where you must keep low.

The lower sketch is of a Japan-

ese type bomb, which is very much bigger than the small German type referred to above. German are 1 K.G., Japanese 50 K.G. Although, of course, less numerous, it creates a far bigger fire and the usual methods of compating same would be ineffective—and with this bomb the main effort should therefore be to minimise the fire as far as possible with all the water at your disposal.

RELATIVE DANGERS FROM AIR RAIDS And Best Methods of Protection As indicated, if Japanese planes bomb South

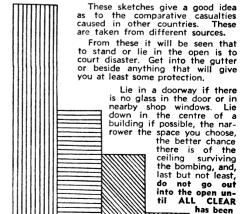
As indicated, if Japanese planes bomb South Australian towns, they will give no warning, and your first knowledge of them might come from the Air Raid Sirens, from the sound of the planes, or from the 'crump" of their bombs.



Don't stay in the street to gape—go to the nearest shelter at once. If you cannot get into a building, lie flat in the gutter, face down, your mouth open, hands over ears—and with your elbows supporting the weight of your body, so that the chest is slightly clear of the ground. To hold a rubber between the teeth has been advocated by some, but this is not actually advisable.

All the above may sound nonsense, but it isn't. Bomb blast, as shown on the opposite page, spreads out (and if the bomb bursts on the surface, it spreads almost flat), so get as near the ground as you can—you cannot possibly get above the blast, so try and get under it.

By opening your mouth, and giving your chest freedom, you give your lungs a chance to take the shock of the blast. Blast can affect you a great distance from the bomb.



(1) Standing in street. (2) Lying in street. (3) Lying behind low cover or in doorway. (4) In shelter affording head and side cover away from glass. (5) In covered trench.

sounded.

BOMB BLAST AND SPLINTERS

The behaviour of the civilian population during an air raid depends entirely upon the amount of knowledge that the population possesses. In London, casualties dropped considerably after the first few raids because people began to understand more about the methods of bombing and the power of bombs.

Australians, too should make a point of knowing these things. "What can these things. Apart from incendiaries, the two bombs most commonly used against civilian obare generaliectives purpose bombs and fragmentation or personnel bombs. or anti-The first are designed to give maximum blast or frag-mentation, and are fitted with delayed action as well as impact fuses. The second type weighs 4 to 25 lbs, and explodes impact, and these on bombs are usually dropped in groups.

the moment of Αt explosion a bomb bursts into thousands of frag-ments—tiny pieces and jagged chunks of metal -which hurled are ---which are hurled through the air. At the

same time, hot compressed gases are released at a velocity of severel thousands of feet per second.

These gases set up an intense shock wave in the air, which is known as "blast."

The effective "killing range" of flying fragments averages about 50 feet, but if the explosion occurs just above ground in open country this range can extend the 1200 and the terror of the standard terror of the stand this range can extend to 1,200 yds., the range varying with the kind and size of the bomb.

Blast can cause the death of living creatures

without any external wounds. It will blow down walls, tear up pavements, and fling rubble im-mense distances. A man standing within 30 to

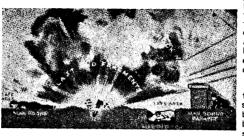
50 feet would be torn to pieces by blast, and a brick wall would be shattered into a hail of projectiles, capable of killing people at a great distance

Actually blast causes death by increasing the normal atmospheric pressure on the body; or by the vacuum suddenly reducing the external pres-

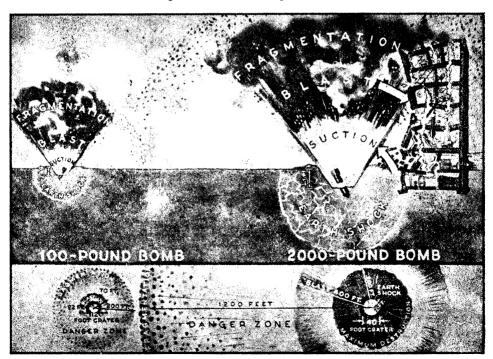
sure, causing heart and lungs to burst. It is also found that blast affects fat people less than thin ones; that the older you are the less blast will hurt you and that its effects prove worse indoors than outside.

Within a radius of 200 feet blast pushes in or sucks out windows, and beyond that distance breaks them by violent shaking. Immediately after the blast, there is an "effect of suction" which will drag out the walls of nearby buildings and cause them to col-The effects of lapse. blast and suction from a 2.000 lb. bomb have been recorded nearly a

mile and a half away. Explosions of 100 lb. and 2,000 lb. bombs are compared and analysed in the accompanying illustrations. With fuses set for delayed action, the bombs cratering in the earth, transmit part of the shock of their explosion through the ground (see diagrams). A wall supported building within the range of the earth shock disintegrates at its foundations. The simultaneous action of the air blast, hurled upwards by the crude mortar shape of the crater, blows in the walls, and a negative suction wave pulls the debris outwards. A vertical view of the blast shows the horizontal range of fragments.



Example of 100 lb. bomb exploding in street it is dangerous to anyone standing within 20 feet. However, as the fragments are deflected upwards, there is a fairly safe area within a very short distance of the bomb. This illustration shows the advantage of the prone position—the added advantage of a ditch or trench and the protection from fragments afforded by some sort of cover.



SHELTER IN THE HOME

There are few home-made air raid shelters of any sort which will survive a direct hit from a high-explosive bomb, but you will be unlucky if you are in the small area which gets a direct hit, and therefore certain precautions are well worth taking.

Several ideas in connection with slit trenches are given on other pages, but for those who prefer the protection of their houses, the following notes should be borne in mind.

Most well-built brick or stone houses can provide quite effective protection against anything but a direct hit if certain precautions are taken.

One room in the house should be selected with as many walls as possible around it. That is to say, use the middle room—the walls of the other rooms will give it added protection. If only two rooms are side by side, use the one farthest from the street. Also, if possible, select a room with



The best room in this house is the kitchen, and the safest place is the corner marked.

the smallest area of glass, as few doors, windows, and ventilators as possible.

If the only room available is an outside room, minimise its danger points. Select the one with the strongest outside walls. Avoid a room that has a lot of ornamental work on the ceiling. Take advantage of the protection afforded by neighbouring buildings.

A room near a garden is better than one near

a pavement of any sort.

A good place to take shelter from falling debris A good place to take shelter from falling debris is under a good, strong dining-room table, which should not be against or opposite a window or doorway. However, a good idea is to place another table near a window of an inside room, piled high with books packed and bound together as a protection from flying splinters from outside. Lateral protection from blast and splinters is best provided by study side walls, but provided

best provided by sturdy side walls, but overhead protection should also be arranged if complete

protection is required.

If you are going to make your air-raid shelter within the home, give the matter a lot of thought. It is important. If you are in doubt, CONSULT YOUR LOCAL WARDEN—he will best advise you.

IN ANY CASE, SEE THAT KNOWS WHERE YOU AND INTEND TAKING SHELTER. YOUR WARDEN YOUR FAMILY

HOW TO FIGHT FIRE BOMBS With and Without Shield

Even though the possibility of air raids may seem a little remote, the apparently impossible has so often happened in this war,
The sketches shown below will indicate methods

of combating the incendiary fire, either with or

without shield.

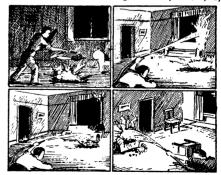
Usually the small explosive charge in an incendiary bomb will explode within two minutes of impact. If you should attack the bomb, either before or after the explosion, adopt the same methods for extinguishing it. If, by the time you attack it, it has not started so big a fire that attack it, it has not started so big a tire inat you cannot approach it, grab your sand mat, hold it in front of your face when approaching the bomb, and drop it squarely on top of the bomb.

Do not just throw it in any haphazard way. You can, of course, protect your face with a rubbishtin lid or other shield if preferred.

With the sand mat on the bomb, take a half bucket of sand, shovel, and rake or hoe. Put the bucket beside the bomb, and with the shovel in one hand and rake in the other, push the shovel under the bomb, at the same time drawing the BOMB AND SAND MAT on to the shovel with the rake. Quickly transfer bomb and sand mat into the sand bucket; slip the rake handle under the handle of the bucket, and carry it into the garden.

If the fire has been too severe at the outset to approach the bomb, crawl towards it with the stirrup pump or hose, and play a thin jet of water on the burning furniture and furnishings of the room, BUT DO NOT play the jet of water on to the bomb.

When a fire in a room has been subdued, adjust the hose nozzle to give a very fine spray,

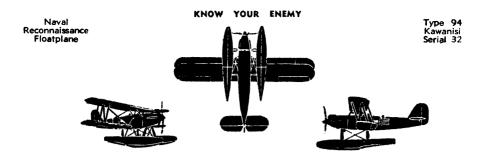


and turn the spray on to the bomb. It will burn more fiercely, but will burn itself out more quickly. Once it is well subdued, shovel it into a

bucket of sand and get it outside.

One good idea is to turn a chair on its side, and use it as a shield as you hose the bomb or fire.

These notes refer more particularly to the small German type of incendiary, and not to the big Japanese fire bomb mentioned on Page 6.



SAND DEVICES FOR FIRE FIGHTING

It is advisable to subdue and control incendiary fires with the utmost speed, and one of the most convenient materials for this purpose is bone-dry sand. Sand will not actually extinguish the outbreak, but it will reduce the violent activity to a degree where it can be handled with comparative ease.

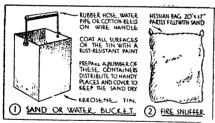
It is advisable to have the sand ready at hand in a tin, as shown here. In action, one method is to first pour the sand out of the tin on to the shovel, and then sprinkle (but do not throw) the sand on to the bomb or fire.

The alternate method, as pointed out in the previous paragraph, is to place the sand firer snuffer gently on to the bomb. Then, very rapidly, to prevent further damage to the floor, use the hoe (which will be described in another column) to scrape the burning mass on to a shovel, and then deposit it on to a thick layer of sand in the bucket. Then take it to a safe place to burn itself out.

Any ordinary fire outbreak can be douched with water or beaten out with a rug, but it is futile and dangerous to adopt this method for an incendiary.

Details for making a Sand or Water Bucket and one type of Fire Snuffer are as follows:

Sand or Water Bucket (Fig. 1).—Cut out top of kerosene tin with vin opener, hammer down



rough edges, punch two holes with a large nail; if possible, solder a metal washer over each hole for reinforcement; thread a 10-inch length of hose or cotton reels on to a 2-ft. length of heavy wire for a handle grip; bend the wire handle into shape with pliers; coat tin with rust-resistant paint, and fill the bucket with sand or water, as desired.

Another way is to get, say, two petrol tins, and cut them across the centres, to make low buckets—they may be easier to handle. Make a wire handle for each, while the hole through which petrol was taken could be closed with a piece of cardboard, as those tins would be for holding only sand or earth, and not water. You cannot have too many such receptacles for holding water and sand.

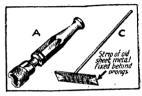
An important factor as far as a woman is concerned is the size and weight, and they should be able to handle one of these half buckets easily. This is a point worth watching.

Fire Snuffer (Fig. 2).—Partly fill a 20 in. x 17 in. hessian or canvas bag with dry sand, and stitch opening to make a thin cushion, as shown.

OTHER SIMPLE FIRE-FIGHTING EQUIPMENT

Fire fighting is simple, and it is not necessary to have elaborate and expensive equipment. For one thing, stirrup pumps are excellent to have about the place, especially if the water supply becomes damaged and, although they were hard to get at one time, there are more available now. However, if one does not wish to go to the expense of buying one, and does not share in one with his neighbours, he will perhaps need something to fall back upon in an emergency.

This is where the garden hose will be found handy, provided it is fitted with a nozzle as shown in this sketch (A), which can be adjusted with finger and thumb to give either a jet or a spray.



By trial, find out just how far your hose reaches through the house if fitted to the various taps available. One must not rely on the fire brigade—it may have too much to do with bigger ichs.

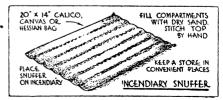
After using the hose in this fashion, proceed to attack the bomb as previously indicated. Another handy-sized sack can be cut down to a size approximately 16 in. x 14 in. Put sand or very dry earth (provided the latter contains no vegetable matter and is broken up and is not lumpy) into it, until it resembles a not too tightly filled cushion. Stitch the open side.

tightly filled cushion. Stitch the open side.

Next, have a look at your spade and rake or hoe. If you devise means of extending the handles by strapping or screwing other handles to them, do so, but make sure your work is firm and secure. Wire a piece of galvanized iron to the head of your rake (C), unless, of course, you have a Dutch hoe.

ANOTHER TYPE OF SANDBAG SNUFFER

This is another type of sandbag snuffer which is advocated by some. The preparation of this is a simple procedure, and does not take very long.



Make a calico container, or select a hessian sugar bag, and then arrange rows of machined stitches about two inches apart from top to bottom. Leave the tops open.

Then pour dry sand into these compartments, and, when all are full, the top edge can be securely stitched by hand.

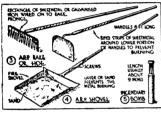




AN IMPROVISED HOE, RAKE AND SHOVEL

The use of sand in connection with the control of fires caused by incendiary bombs has been previously explained and these illustrations will indicate how easy it is to improvise a very good set of fire-fighting appliances. There will be no expense at all if you have an old hoe or a rake and a fire-shovel about the place.

A.R.P. Rake or Hoe (see figure 3). This is required to assist in pulling incendiaries on to the shovel. An old garden rake with a rectangle of



sheet-metal or thin iron can be wired on to the pronged part and a very useful article will then be available.

The sheetm e t a l should project just a

little bit lower than the prongs of the Take to prevent any catching on rough surfaces. The handle should be at least 6 feet long, and the lower portion can be protected with strips of sheet-metal bound in spiral fashion around the handle.

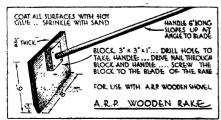
A.R.P. Shovel (see figure 4). This is for sprinkling the sand on to the bomb and lifting them. Fit a 6 ft. wooden rod into the handle of a fire shovel. It may be necessary to open up the handle to admit the rod. Drill or punch two holes in the shovel handle, and drive in two screws to hold the rod securely in place.

Before a burning incendiary is pulled on to the shovel with the rake, cover the blade of the shovel with about a one inch layer of sand to prevent the metal being burnt under the intense heat.

If you wish, you can give further protection to the wooden handles, by coating them with fireproof paint, composed of 2 lb. of slaked lime, 1 oz. of common salt and 1 pint of cold water. Give two coats.

HOW TO MAKE AN A.R.P. WOODEN RAKE

It is futile to hope that a fire could be controlled with no equipment, and it is the uncertainty of events that makes preparation im-



perative. If, therefore, one wishes to make the standard equipment, the following details will help. The blade, which has a bevelled edge, can be made from an 8 in, x 6 in, x $\frac{3}{4}$ in, piece of hardwood. The easiest method of fixing the handle securely to the blade is to fit the 6 ft. handle into a hole, drilled at a slight angle for it, in a 3 in, x 3 in, x 1 in, block of wood. A touch of glue in the joint and a $2\frac{1}{4}$ in, nail driven through the side of the block and into the handle will make that part secure. If you file off the point of the nail before driving it in the wood will not split.

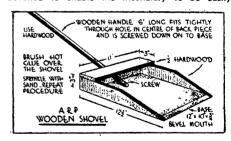
Drill 4 holes near the corners of the block to take $1\frac{1}{2}$ in. screws, and then the block can be screwed on to the back of the blade.

It is advisable, to reduce the effects of fire on the wood, to coat all surfaces of the rake and the lower portion of the handle with hot glue, and while it is still hot sprinkle on a liberal amount of sand.

A.R.P. WOODEN SHOVEL IS EASY TO MAKE

It has been proved that the wooden type will outlast metal implements. Naturally, the wood will burn, but especially if coated with sand, the amount of burning is very small. Even if burnt extensively, repairs can easily be made.

The diagram shows the method for constructing the standard type A.R.P. shovel. Hard-wood should be used. The base should not be smaller than 12 in. x 10 in. $x \frac{3}{4}$ in. The front edge is bevelled to enable the incendiary to be easily



pulled on to the shovel with a wooden rake. All the other pieces of timber should be $\frac{1}{2}$ in. thick, and of the dimensions given in the diagram. The sides are shaped with a saw and nailed on to the base first, then the back piece, which measures 10 in. \times $\frac{1}{2}$ in. \times $\frac{1}{2}$ in., and finally the top.

You will find the method for attaching the long wooden handle very satisfactory, and if the construction is reasonably well carried out, there will be no danger of breakages. The hole drilled in the back piece should allow the handle to just pass through, and then the handle can be screwed down securely on to the base of the shovel. A reinforcing nail can be driven through the handle and the back piece.

All the surfaces, both inside and out should be coated with hot glue, and while still hot, give a liberal sprinkling of sand. If necessary, repeat the procedure. This coating of sand helps to prevent the wood taking fire.

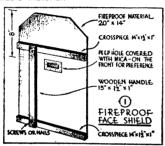
HOW TO MAKE FIRE FIGHTING SHIELDS

A very important item for dealing with incendiary bombs is the fire-fighting shield. It enables the fire-fighter to approach quite close to the bomb with safety.

Although the bomb is only about 9 inches long,

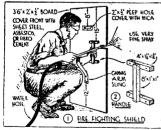
the heat it generates is extremely great, and as it is liable to explode within two minutes of landing, hence the necessity for a shield of some description.

It is also wise to have a pair of dark glasses handy so that they can be put on in an emergency as this will help to diffuse the intense light from the bomb. These should be made from noninflammable material.



One of the most useful articles for this purpose is the ordinary garbage tin cover as it has a very useful handle and is of very convenient size and

Another useful idea is that shewn in the first illustration. This can be quickly made from very little material and can also be made fire and shatter proof by the addition of some fire-proof or other material. It measures 20 inches x 14 in. On the back you can fix with screws or nails two 14 in. \times 1½ in. crosspieces, and on to these pieces fit a 15 in. \times 1½ in. handle. A small peephole, measuring 2 in. \times ½ in. should be cut through the



shield. An easy method is to drill two holes with centres $1\frac{1}{2}$ in. apart, then cut out the intervening space with a chisel or keyhole saw. Mica can then be tacked over the hole.

The second illustration is of a somewhat similar idea in operation, which includes a piece of 3 ft. 2 in. x 2 ft. piece of sheet steel, asbestos or other fireproof material, a 3 in. x 1½ in. piece of mica and a strip of canvas or leather.

How to Make Them. In the centre of the board How to Make Them. In the centre of the board 8 in. down from the top, cut out a 2 in. x \(\frac{1}{2} \) in. peephole with a chisel, or else drill 3 \(\frac{1}{2} \) in. holes, and then square up by cutting out the intervening portions with a sharp knife. Tack the piece of mica over the hole for protection.

A hose slot about 18 in. from the top edge on the right-hand side of the shield can be cut with a saw, and in the position indicated you can nail or screw on the wooden handle (fig. 2).

or screw on the wooden handle (fig. 2). Then tack on the canvas to enable the shield to be carried easily with the left arm, while the right hand is free to operate the hose.

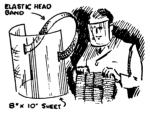
Finally cut out the peephole and the hose slot in the sheet steel, and screw it in to the front of the shield.

In the event of your not having a shield of this description you could use a metal firescreen or an up-ended table to approach the outbreak.

THESE SHIELDS ARE CARRIED WITH THE LEFT HAND IN FRONT OF THE FACE, with the right hand free to carry the fire-fighting equipment. On no account pick the bomb up with the fingers.

ANOTHER NOVEL IDEA FOR SHIELD

This is rather an unusual idea which has the advantage of being easily adjusted over the head



and, at the same time, leaving both hands free to help in s m o thering the bomb.

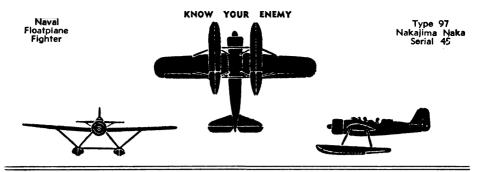
It makes an excellent protective mask and should be a pproximately 8 in, x 10 in. but it must be made of some

non-inflammable material. It need not be transparent as holes could be cut for the eyes in the same manner as the preceding articles and dark glasses could be used in conjunction with it. An elastic ribbon can be cemented or fixed otherwise to the edges as shewn.

AN IMPORTANT AIR RAID HINT

Do not rush the telephone in order to enquire from your friends as to how they are getting on, even if you think a bomb might have exploded in their vicinity. In any case the phone will probably only be available to certain officials during air raids.. Therefore, DO NOT USE THE TELEPHONE.





TRENCHES PROVIDE GOOD PROTECTION

The protective value of the slit trench has been well proved under actual bombing conditions, so, if you have not already constructed a slit trench, you can proceed with the knowledge that it is one of the best simple provisions against air raids.

Those shown here represent types which have been found very successful and easy to construct. These ,and all other such trenches, should be built at least 20 ft. from the house, or more if the house is of more than one story. The usual depth is 4 ft. deep below ground level, with the excavated material thrown up on each side to give a total depth of 5 ft. 6 in. Reports from many sources indicate that a shallow trench, such as that shown in the top illustration on Page 7, is preferred and is very effective, but, of course, one would have to remain in a prone position.

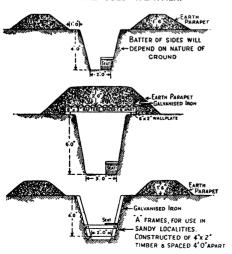
is preferred and is very effective, but, of course, one would have to remain in a prone position. The trench should not be less than 2 ft. wide at the bottom, allowing in length 2 ft. for every member of the family. The entrance (ramp, steps, or ladder) should be protected by a wall, at least 2 ft. 6 in. thick, of sandbags, or of boxes filled with earth.

Care should be taken to keep the surface water from entering, and to provide inside drainage.

Overhead Cover (see central sketch).—This type of trench should be dug 6 ft. below the natural surface. If in firm ground, supports for the sides may not be required, but in sand or other friable material, timber frames and corrugated iron will be found necessary.

If the permanent ground level is near the surface, breastworks made of sandbags or boxes filled with earth will be necessary.

THERE IS A BIG DISADVANTAGE IN OPEN TRENCHES IN THAT THEY ARE POOR ACCOM-MODATION IN THE COLD WEATHER.



ANOTHER TYPE OF OPEN TRENCH

With high explosive bombs, the fragmentation and blast travel, to a great degree, horizontally, and this is the reason why the slit trench gives adequate protection against these dangers.

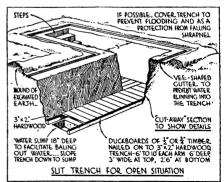
If you hear a bomb falling, crouch down so that your head is well below ground level. If, say, a bomb falls nearby, say 50 ft. away, an avalanche of dirt will be hurled over you, but because the trench is narrow it will be possible for you to straighten yourself and throw the dirt off.

Hundreds of lives in the Middle East and other places have been saved by this method of protection, as it has proved amazingly efficient against the above two dangers.

The diagram given in this column depicts part of a trench, with a cut-away section to show the sump at the lower end, and duckboards on the floor. The trench should slope downwards slightly towards the sump, so that any water which finds its way into the trench will collect in the sump. This water can be easily baled out with a tin.

Duckboards provide the best type of floor in a trench, because the surface will keep dry, and your feet will not be affected by cold, as is the case when standing on bare earth or concrete. The duckboards for each arm are easily made with two side pieces of 3 in. x 2 in. hardwood, which rest on the floor of the trench, and on to these side pieces should be nailed the ½ in. or ¾ in. boards. Pieces of packing cases are ideal.

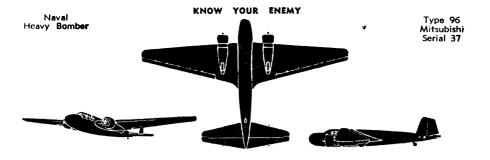
Do not make the arms of the trench longer than necessary. The safe limit is about 15 ft., and the arms should form a right angle. The trench should be situated at least 20 ft. from



a single-storied house. It may be necessary to board in the sides to prevent earth movements.

The V-shaped gutter at the top of the trench should be kept clear to carry away water that would otherwise run into the trench.

If necessary, cover the trench with galvanized iron, supported by sturdy cross pieces of wood, to keep rain out, and, if you wish, earth or sandbags can be heaped on top.



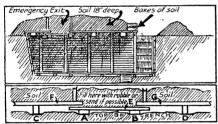
COVERED TRENCH SHELTER With Emergency Exit

In constructing a covered trench, the whole of the trench except the entrance should be covered. Use sound timber at least 3 in. x 2 in. for the main supports, laying them about 18 in. apart across the narrow width of the trench.

It is not absolutely necessary to make an emergency exit—to give you a means of getting out of the shelter should debris block the entrance—but if it can be made without great difficulty, make it.

Exactly how you will do it will depend on the material you have available, but the general principle is to leave some sort of trap-door in the roof, wide enough for the largest person using the shelter to climb through. But do not forget that the trap-door must support 18 in. of soil. Hinges and bolts might not take the weight, especially if heavy rain fell.

A simple emergency exit can be made by tipping the crosspieces A and B on their side, and sinking them about $\frac{1}{2}$ in. into the ground. With the other crosspieces standing on their



narrow sides, the upper sides of A and B are about 1½ in. below the upper sides of the other crosspieces. The "trap-door" (E) comprises narrow pieces of 1-in. timber just long enough to overlap A and B. The remainder of the roof is 1-in. timbering (F and G), made to overlap each end of E slightly.

Pile soil on top to a depth of 18 in., and if possible keep the space above E as a pocket of sand or of rubble, so that when the pieces of wood at E are knocked out of place, the sand or rubble will pour easily into the shelter, leaving a tunnel through the soil on the roof of the shelter.

Provided D and C are not too close to B and A, it is easy enough to knock the pieces of wood out of place with the back of a tomahawk or light axe, using a short piece of 1-in. wood like a punch to knock them clear of the crosspiece. Once one end of a piece is clear of A or B it can easily be levered out of place. A mattock or pick may be necessary to cut through the soil above it if it has not been possible to cover E with free-running soil.

The entrance should be protected by a mound of earth about 1 ft. back from the lip of the trench.

OTHER HINTS ON MAKING A SHELTER Showing Another Plan of Covered Trench

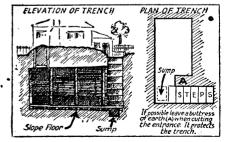
Another good idea in connection with the position of the trench, in order to prevent debris falling into it, is for it to be constructed as far from the nearest wall as the height of the wall. If possible, it should be in a spot where the house, neighbouring houses, and the garage or outbuildings give it some protection without being too close to it. It should also be in a spot where it will not be swamped by surface drainage after rain.

Begin with the idea of making your trench at the most 3 ft. to 4 ft. wide at the top and at least 6 ft. long; remember that it is easier to widen it than to reduce its width. A mattock is an excellent weapon with which to begin the attack, and a shovel is better than a spade. Don't overdo the digging unless you are used to it, and remember that a little water left in the trench overnight makes the digging easier next day.

The hardness of the earth may have some bearing on the depth of the trench, but it should be at least 4 ft. to 5 ft. deep; more if convenient.

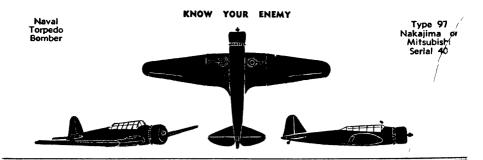
It is also a good idea to cut the entrance at right angles to the main trench, and keep it as narrow as possible, getting all the members of the family to test the entrance for convenience as you cut it. By turning round and entering the trench backwards as they get near the junction of the entrance and trench, they can manage with a much narrower entrance.

The floor should slope to one end, where a trough 3 in. to 4 in. deep should be cut to act as a drainage sump. A trench like that illustrated here is a very convenient one, with the sides boarded with timber or corrugated iron and timber as desired. It is surprising what old timber, iron pipes, etc., can usually be found about the home which can be used to make such a trench more comfortable. Wooden plugs can be driven into the sides of the trench to support seats.



Such a trench can be very comfortable, dry, and quite safe from anything but a direct hit.

The whole of these articles regarding trenches can be read separately or in conjunction, in order to obtain a summary of the most convenient methods to follow.



WHAT TO TAKE TO THE SHELTER

And Useful Articles to Have in a Handy Place

The furnishing or equipment of your shelter should be considered fairly carefully. A room gives more scope for comfort and something in the way of luxury, but there are basic principles for both room and trench.

The most important things to have in a room or a trench are a mattock or pick, an axe, a spade, and possibly a hand saw. These would give you some chance of escape if you were partly buried or blocked in your shelter.

Next in importance is warm, weather-resisting clothing, and you might include a cushion or two,

unless your shelter is sufficiently comfortable in itself. Next you need at least one electric torch. Food and drink are largely a matter of choice. You may think that the hour or two in the shelter. will pass easily without strain, but the period might stretch out for much longer, and nerves and cramped body might need some sort of stimulant. Why not a thermos of coffee or tea. There is no better stimulant. Chocolate or barley sugar are excellent condensed foods.



A handy means of boiling the kettle will do much to pass the time away, whilst a gramophone or portable radio will also do much in that respect. It is wise to have something to take your mind off the sound of bombs and anti-aircraft fire. A ort the sound of bombs and anti-aircraft fire. A portable radio is also very useful in that it might be the means of receiving any important message that may be broadcast. If you have a small first-aid kit, take it to the shelter also.

If your shelter is a room in the house, the safett bless would be beneath a soil table sheet.

safest place would be beneath a solid table placed against two walls in a corner of the room. A mattress thrown on the top, as indicated in the accompanying sketch, would increase the protective value of the table, whilst a double thickness of books will also give good protection.

If you are caught unawares, why not put a stout table against a wall in a personer and shock

table against a wall in a passageway, and block two ends of it with mattresses, or, if you have time, books. It would be much better than nothing.

WHAT TO DO BEFORE GOING TO THE SHELTER

Last thing to be done is to switch the electric power off at the main switch and turn off the gas at the meter. Your house wireless could be gas at the meter. Your nouse wireless could be used right up until you switch off the main power in case important instructions are broadcast. If he electric power or gas are left on during a aid, and the house is damaged by a bomb, fires can be started or someone may be killed by

electricity.
Some A.R.P. experts advocate leaving windows and doors partly open, as this is said to reduce the chance of damage by bomb blast and the resultant action. It may do so.

HOW TO MAKE A TABLE SHELTER

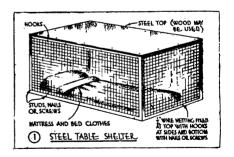
There are various views on the subject of suitable air raid shelters, and these notes are designed to cover whatever method the particular house-holder desires to adopt. Some prefer to remain indoors and accept what possible protection the house affords.

The lives of many English people have been saved by sheltering under reinforced staircases and table shelters, preferably, of course, of the steel type. We are all confronted with the question as to what constitutes the best form of shelter, while at the same time giving consideration to various other aspects. The answer to some people is the steel-top table shelter in the refuge room, but, of course, there may be the difficulty of procuring the necessary steel.

However, these notes can also apply to a table made with a good solid top of any description, and if the wire work for the sides cannot be obtained, a wire mattress or something else could probably be improvised. This type of indoor shelter would give excellent protection to infants.

Comfortable sleeping quarters could be arranged in such a type of cover, as a mattress and the usual bed clothes or rugs could easily be fitted in. You would make your table to conform with the size of your mattress.

You may, of course, be able to press into service a very heavy type of kitchen table. Angle iron would naturally be ideal for the construction of a suitable table, but it would be almost impos-



sible for the average householder to procure the material. By the way, if the table is made out of doors, make sure that you will be able to trans-port it in through your doorway openings.

The legs of the table must be sufficiently strong to prevent collapse under heavy burdens; Good construction is essential.

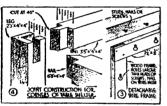
The following notes will show how to go about making such a table, and even if it is not possible to make such a type now, owing to shortage of materials, the information may prove useful to many at some time or other.

FRAMEWORK FOR THE TABLE SHELTER

The illustration next given depicts the arrangement of timbers required.

Wooden members of at least 4 in. x 4 in. section should be fixed between the base of the legs as well as at the top, to prevent the collapse of the legs.

After completing the framework, drill holes about 2 in, in from the edges of the heavy steel top, and then you can screw it down on the The screws should be closely spaced, framework. and should be long enough to grip very securely into the wood to help make a very solid job. It is advisable



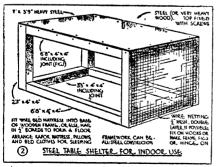
to have one piece of steel for the top, but if his is not available or 3 pieces can be used. If more than one piece is selected, you should put

in extra cross-pieces to give adequate support under the joins of the steel plates.

If it is not possible to obtain steel, the next best material will be very thick wooden planks for the top, or else 2 or 3 layers of wood, with the grain of each layer crossing the other at right angles.

COMPLETION OF THE TABLE SHELTER. Great

care is necessary when cutting out the joints for the various rails and the legs of the table. After cutting the timbers to correct lengths (see fig. 2), mark with a pencil the setting out of the joints,



and, where possible, make all the cuts with a saw. Use a chisel to cut out the remainder of the joints.

With all the joints complete, fit the wooden members together temporarily to check for accuracy. Then you can disassemble, and glue together the 4 pieces to form each end. Allow a day for

the glue to set, and then the side rails can be glued in position. The glue should set under pressure of clamps, or else you can place ropes around the table framework. These ropes should be twisted to compress the parts of the joint securely into each other. As an extra precaution the joints could be reinforced with metal strips bent at right angles, and screwed on to the corners.

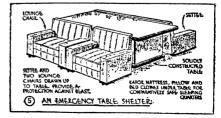
frames are necessary as a flying debris. A double layer of Wire as a protection against flying debris. A double layer wire fixed on the table will be ideal. of 1 in. bird can be removable, otherwise 3 should be fixed to the table permanently, with only one movable screen to allow access to the underneath part. Fig. 3 shows the wire framework construction. If you wish, one screen can be hinged to the table along the top edge, or else you can cut out slots in the framework, as shown, to form the remov-able screen. The projecting heads of screws or large-headed nails driven into the table should project just a little more than the thickness of the framework timber. After completing the wire framework timber. After completing the wire frame it can be pushed or pulled over the heads of the screws, and will then slide down the shanks of the projecting screws, to be held securely in place by the heads.

You can take inside the shelter any articles such as a torch and tinsnips or old scissors to cut through the wire in case of emergency.

AN EMERGENCY TABLE SHELTER

If you are caught unprepared in an air raid, this idea will at least give you some protection from blast and flying debris. On receiving an airraid signal you simply draw up the lounge suite and any other heavy articles of furniture around the dining-room table. If time permits you could spread a kapok mattress and pillows on the floor space of this improvised shelter. You should try completely to cover the open sides of the table completely to cover the open sides of the table with furniture to offset the effects of blast.

Make sure that all movable articles that may splinter or be flung about by blast are placed away in safe positions. You must realise that the blast of a near explosion will drive with terrific force all movable articles, and will also shatter permanent fixtures; therefore you should provide if possible a more substantial form of shelter than the superficial type suggested above.



Always lie as low as possible in a raid, but keep the chest raised above the ground by means of the elbows, or a very soft, thick cushion. Keep your mouth open.

Naval Dive-Bomber



Mitsubishi Serial 88

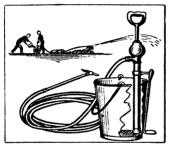
USING THE STIRRUP PUMP

Although stirrup pumps were hard to obtain for some considerable time, more are available now. If you can get one, do so, or join a group amongst your neighbours and have one between you. The advantage in this is that you are then independent of the ordinary water supply.

With the pump you need 25 or 30 feet of hose

With the pump you need 25 or 30 feet of hose and at least three full-sized buckets—or more

smaller ones. Ìn whefact ther you rup pump or not, you need two or three buckets of sand and water. If you have stirrup pump, fill your bath water. with and fill the w a shhouse troughs so



that you have a good supply for use with the pump, in addition to that in the buckets.

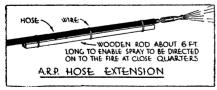
Two people are needed to use the pump, and user efficient work can be done with 3. One man uses the hose, crawling toward the fire bomb while another works the pump direct from a bucket. The third keeps filling the bucket from which the pump is working. The longer the hose the greater the comfort in which the pumper and the supplier can work.

If you have any sort of garden spray pump it may do the job quite well. Give it a test. To be of real use it should throw a jet about 15 or 20 ft.

of fine spray for 10 ft. or so.

A USEFUL EXTENSION FOR YOUR A.R.P. HOSE

Perhaps for some reason you may not be able to reach the seat of the fire unless you have some extension to your hose.



In this connection, it is only necessary to wire or tie the hose on to a wooden rod, measuring from 4 to 6 ft. \times 1 in. \times 1 in. Small niches cut into the rod will prevent the wire bands from shifting their positions and working loose.

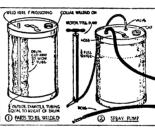
Those who may have constructed the spray pump as described in another column, will find that the extension will allow the spray to be directed close to the fire without high air pressure being pumped into the drum.

A HOME-MADE INCENDIARY SPRAY PUMP

If one has a few odds and ends lying about the garage, etc., and cares to try his hand at making his own spray pump, the following is an excellent improvised type which can be relied upon to give a very good performance. With the exception of a little welding, construction is very easy, and your motor tyre pump will not be spoiled in any way.

Materials. A heavy-gauge iron oil drum, a brass threaded cap of about 2 in. diameter, and a brass threaded collar to suit (say from an old petrol carrying tin), a length of \(\frac{1}{2} \) in. outside diameter piping equal to the height of the oil drum, a motor tube valve stem and valve, 2 rubber washers to fit same, a hose clamp, a length of hose, an adjustable hose nozzle, and a motor pump. On no account use a kerosene-tin in place of the oil drum.

If you cannot have the brass collar welded on to

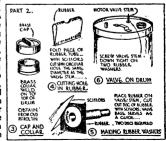


the top of the oil drum over the spout, it will have to be cut off with a hack saw or a chisel. The hole for the ½ in. piping can be drilled with a ½ in. bit, or else you can use a

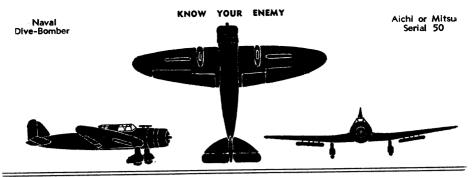
drill as near ½ in. as possible, and then use a round file to make a hole to the required size. The piping should project 1 in. from the top of the drum, and it should be about 1 in. above the bottom.

The valve stem (fig. 6) can be taken from an old motor tube by unscrewing the nut on the stem. In any position through the top of the oil drum drill a hole that will just take the valve stem. After cutting a rubber washer as shewn in figs. 4 and 5, and placing one on the valve stem, drop one end of a length of string down this hole, and with a hooked piece of wire, poked down

through the filler hoie, pull out the string. Tie the string around the valve stem, drop valve and strina back into the drum, and you will find it an easy matter to pull the valve stem up through the hole



drilled for it. Then place a second rubber washer on the valve stem, then the metal washer that belong to the stem, and finally screw down the valve nut very tightly. The valve inside can be screwed into the stem.



Now clamp the length of hose (at least 4 ft.) on to the projecting pipe from the drum, and with the adjustable nozzle on the other end of the hose your apparatus will be ready for a test.

Connect the motor tyre pump to the valve, screw the adjustable nozzle to the closed position, and pump air into the drum. Experience will tell you just how much air is required for good results. When the nozzle is opened slightly a very fine spray will be emitted.

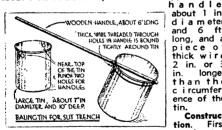
A HOME-MADE BALING TIN FOR SLIT TRENCH

troublesome feature of the slit trench is its likelihood of becoming waterlogged during wet

Use of the stirrup pump is a very practical way out but, as comparatively few people possess this tem, a baling tin can take its place. The long handle enables the tin to be used equally well when you are in the trench or up above.

A water sump, dug in the lowest end of the trench, will allow the water to collect there to facilitate baling out and it is then quite a simple and easy matter.

Materials. Any old tin of suitable size, sav about 7 in. in diameter, and 10 in. deep; a wooden



about 1 in. d i a m eter and 6 ft. long, and a piece of thick wire 2 in. or 3 longer in. than the c i rcumference of the

Construction. punch

holes of the same diameter as the handle, directly opposite each other, and 1 in. below the top edge of the tin. Try to obtain a very tight fit, and for this reason it is a good idea to make the holes slightly small, and then force the handle through into position.

Now you can drill 2 small holes through the handle, as near to the outside surface of the fin as is possible, to enable the piece of thick wire to be threaded through, and twitched very tightly with pieces. with pincers or pliers.

Leading away from the vicinity of the slit trench, dig a small gutter into which water from the baling tin can be emptied. This will prevent muddy conditions near the trench.

If a stirrup pump is used, it is a good plan to drop a small tin into the water sump in the trench, and to place the lower end of the pump into this tin to prevent grit and mud entering, and perhaps clogging the apparatus.

IDEAS FOR YOUR TORCH

This is an idea for reducing the glare. Simply unscrew the metal cap at the top, reverse the metal reflector and the glass (see sketch), and replace the cap. This should reduce the ray replace the cap. This should reduce the ray sufficiently, but if not, you can dismantle the cap, glass, and reflector, and insert a piece of tissue paper over the globe.



your torch b e c o m e s dim, economy can be effected by changing the globe for one of lower volt-That age. if

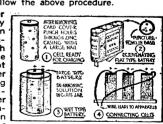
have a 2.5 volt globe in the torch, replace it with a 1.5 volt globe. Remember to replace the original globe when the batteries are renewed.

Other ideas for Reviving Batteries. Usually it is possible to slip the zinc cell out of the cardboard cover, and then you can punch a few holes through the zinc casing with a nail and hammer (fig. 1). The nail should penetrate almost to the centre, but be careful not to break the centrally placed carbon rod.

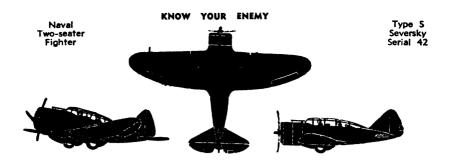
Next dissolve a tablespoonful of powdered salammoniac in a cupful of water, and then immerse ammoniac in a cuprul of water, and then immerse the zinc portion of the punctured cell in this solution for an hour or two. On taking it out, allow it to drain, after which the holes can be sealed with pitch, or any other suitable composi-tion. Replace the cell in its cardboard cover.

The prepared sal-ammoniac can be kept for a number of occasions. If you have the flat type of battery, open the bottom portion of the card-board covering, and punch holes through the base of the cells to a depth of about 1 in. (fig. 2), and then follow the above procedure.

The larger type dry battery can be recharded in much the same way, except that, after r e m o ving the cardboard cover and punching holes in



the zinc the battery is left in a jar containing case, the solution (fig. 3). If the zinc shows signs of being eaten away, place the zinc rod in the jar to serve as the negative side of the battery. Any number of these cells can be connected together with covered copper wire by joining the positive of one cell (the central terminal) to the negative (the outer terminal) of the other (fig. 4). The two free ends of the wire should be connected to the instrument it operates.



FIRST STEPS IN BLACKOUT

Don't rest content on the idea that when blackouts become compulsory you can go to the pictures or put out the lights or just pull down the blinds. You might for a night or two, but not for longer. So blackout your house properly NOW.

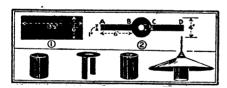
The first step is to remove the globes from all light fittings outside the house—this should have been done long ago. No globes should be left in porches, garages, balconies, sleepouts, or laundries. Removing them means that there cannot be any accidental or wilful switching on of exposed lights.

Now determine which rooms you will blackout, and to do this it is perhaps easier to determine which rooms you can do without and therefore need not blackout.

These will probably be the extra bedroom, the drawingroom, the pantry, and perhaps a passage light. When it becomes necessary to keep your house fully blacked out remove the globes from the sockets in these rooms.

An alternative is to stick adhesive tape over the button of the switch in each room, but this is not so certain as taking out the globes.

You are left now with the sittingroom, one or two bedrooms, the kitchen, the bathroom, and the passageways. Begin on your passage lights—they



are easier, there is something to make, and the experience gained will help for the bigger job of doing the rooms.

These passage lights should be screened so that they shed only a narrow disc of light on the floor. Cut a hole in the bottom of an empty cocoa, asparagus, or other narrow tin; take the globe out of the socket, pass the metal end of the globe through the hole in the tin, and replace the globe in the socket. The tin should be deep enough to extend well below the glass of the globe.

Another method is to cut a rectangle (1) of blackout paper 13½ in. by 6 in. Cut another piece to the pattern shown at (2). Fold down the legs of this piece, A-B, C-D. Roll the rectangular piece into a cylinder with a 1 in. overlap, then pin the legs A-B, C-D to it as shown in the diagram.

The sketches shown above should be all the explanation necessary with regard to the method to be adopted for various types of lights.

BE PREPARED FOR ANY EMERGENCY OR IN-STRUCTIONS WHICH MIGHT BE RECEIVED FROM OFFICIAL HEADQUARTERS.

ANOTHER USEFUL BLACK-OUT SHADE

These two small diagrams show a very good idea for screening an electric light globe. Select a suitable tin, such as the powdered milk type, and cut a 1 in. diameter hole in the bottom. Through the lid, cut a hole just large enough to take the electric light socket. The lid will then replace the light shade. When the lid is fixed in position on

ELECTRIC

LIGHT CORD

LID. OF TIN

ELECTRIC GLOSE

POWDERED

10

FAINT WITH

MATCH ROOM

I"DIAM.HOIF IN

A USE FOR ... OLD TINS-BLACKOUT SHADE

COLOUR

the socket, push the tin up over the globe and force it on to the lid. Only a restricted area of light can show through the bottom opening.

The outstanding advantage of this type of shade is its easy manipulation over the globe.

A MULTIPLE LIGHT SHADE

Easy To Make

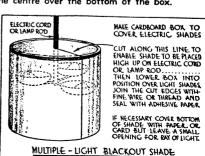
It is not necessary to dismantle multiple-light electric fittings if you have a large hatbox or can make a box from 18 in. strip of cardboard,

long enough to form an encircling cylinder for the particular light. The correct length (allowing for overlapping join) can be worked out by measuring the diameter of the complete electric light fittings and multiplying this measurement by 3½.

Bend the cardboard into a cylindrical shape, and pin the overlapping edges together. Then a disc of cardboard can be fixed into the top of the cylinder with adhesive paper or cloth.

When dry, punch in the centre of the box a hole of the same diameter as the electric cord or rod, and make a cut, as indicated by the line in the diagram, to enable the shade to be placed on the cord or rod. Slide the box down into its position to serve as a shade for all the lights. A collar of thick twine tied around the cord or rod will prevent the box slipping beyond this point.

It may be desirable for a more effective blackout to paste a sheet of paper with a small hole in the centre over the bottom of the box.





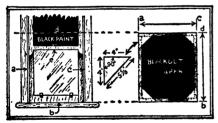
HOW TO BLACKOUT WINDOWS

For blacking out rooms, the householder is faced with a choice of various methods and materials. The size and placing of the windows, their number, and the money that can be spent will determine the choice. A combination of blackout paint and blackout paper might be found best.

If there is more than one window in the room it might be most convenient to blackout the top half of each window permanently, and to make a detachable screen for the lower half. The top half could be painted with blackout paint—which is not expensive—or with a sheet of blackout paper fastened with drawing pins to the window frame.

If there is only one window in the room, the best method is to make a detachable screen for the whole of the window; or else to hang heavy curtains so that they overlap the window generously at top, bottom, and on both sides or to paint the top half and make a detachable screen for the bottom.

Cardboard, fibre board, or plywood can be used in some circumstances in place of blackout paper, but, speaking generally, blackout paper is the most convenient. Plywood, if used, should be



painted black. Warping is among its disadvantages.

Screens are not difficult to make. With most windows they can be made to fit snugly into the area abounded by "a," "b," "c," and "d" in the lower half of the window only they should be made to overlap the top of the window frame for about 6 in.—that is, to "d." Even then it might be necessary to paint the glass with black paint for 6 in. below "e," to prevent light escaping. Tests will determine this.

To make the screen, cut 2 light slats of wood as long as the distance from "a" to "c," and 2 as long as the distance from "b" to "d." Cut 4 corner pieces each in the form of a right angled triangle with sides of about 4 in., 4 in., and 6 in. Assemble the frames by screwing or nailing the slats to the corner pieces; then pin blackout paper or card to the frame.

There are several almost similar methods which can be followed which give almost equal results—we will give one or two others but space does not permit of our including them all. Those given should give a good selection.

ANOTHER METHOD OF BLACKOUTING WINDOWS

This idea is one of the best and most effective methods for blacking out your windows. For each window you will require 2 pieces of thick card-board or 3-ply, about 1 doz. ½ in. screws, and a few tacks.

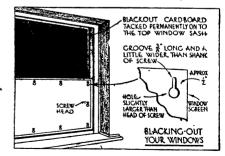
The top window sash can be permanently blacked out by tacking a piece of cardboard on to it. The cardboard should be held with tacks behind the lock on the meeting rail, so that the lock can be operated in the usual way.

For detachable screen on the lower sash, cut out a panel of 3-ply or thick cardboard to just fit inside the window frame, and level with the top of the meeting rail. Drill a series of holes a little larger than the diameter of the heads of the screws at about 9 in. intervals, near the edges of the 3-ply. The centres for the holes along the sides and the bottom can be approx. ½ in. from the edges, and ¾ in. down from the top.

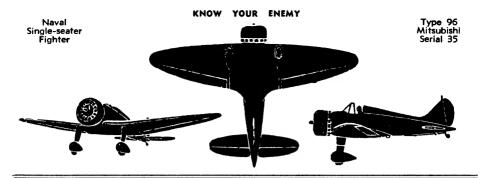
With a pencil, mark the shape for the grooves to radiate vertically from the holes. At the top of each shape, drill a hole very slightly larger than the diameter of the shanks of the screws, and cut away the intervening material with a sharp knife. (See detail sketch.)

The screen can be placed on the window to mark with a pencil the centre of the top of each groove. Drive $\frac{1}{2}$ in screws into these positions, so that the heads project slightly more than the thickness of the material. It is a good plan to first drive in only 2 or 3 screws to check for correct position of the screen on the window.

With all screws driven in, press the screen into position, so that the screw heads project through the holes in the screen. Then allow the screen to slide down the shanks of the screws. The screw heads will hold the screen firmly in place.



This makes a very neat job and, like the preceding sketch, allows for light and ventilation in the day time and complete black out at night. These types of blackout arrangements are specially effective for halls and such places which may beused by different people at different times as there is not much adjustment needed to suit the various occasions.



ANOTHER IDEA IN BLACKOUT BLINDS

Even though the black-out restrictions may be relaxed in some respects, it is still necessary for all to have everything prepared.

all to have everything prepared.

The following idea is therefore especially interesting and good, because of its dependability, convenience and its simple construction.

Specific measurements cannot be entered on certain parts of the diagram, because of the variation in the sizes of windows to be covered, but sufficient data has been given to indicate the measurements you will have to take yourself in order to deal with your own particular requirements.

First of all, cut a 2-inch strip of 3-ply, which is long enough to extend from the bottom of the windowsill to the top edge of the windowpane, and then prepare a $\frac{1}{2}$ in. $x \stackrel{1}{4}$ in. wooden strip of the same length to act as a spacer (fig. 2).

The 3-ply strip can be tacked on to the spacer, and then these combined parts can be nailed or screwed on to the window frame to form a vertical gunner (fig. 1). Place the runner in as far as conveniently possible from the vertical edge of the window glass. Nail on a similar combination of strips on the other side of the window frame.



If you wish, the strips can be stained or painted to match the colour of the surrounding woodwork.

Details of Construction. In the previous paragraphs we indicated the first instructions for the making of this excellent type of blackout blind. Here are more details.

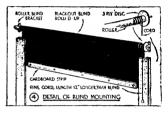
Measure the distance between the inner edges of the vertical runners you have fixed in the window frame, and cut a length 4 in. longer than this distance from a $\frac{3}{4}$ in. diameter wooden rod or roller. On one end of the roller tack a $1\frac{1}{2}$ in. diameter 3-ply disc, and then drive a $1\frac{1}{2}$ in. nail into the exact centre of each end of the rod, but allow a $\frac{1}{2}$ in. length of the nails to project (fig. 3).

The blackout paper for the blind should be tough and heavy in weight, but not so stiff that it will not roll up easily. It is important that the paper should be of the

It is important that the paper should be of the proper blackout quality, and therefore it may be necessary to purchase from a store which carries stocks of regulation materials. If it is not possible to purchase the paper, very heavy brown paper will do, but it may be necessary to paint one surface to increase the density, and in any case a test should be made at night for evidence of glow showing through.

The width of the paper should be 2 in. wider than the distance between the inner edges of the vertical runners, and at least 6 in. longer than the height of the window.

end One of the paper should Ьe nailed sesecurely to the roller, so that an equal amount of the roller projects from both



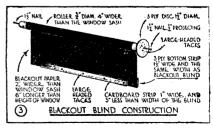
sides of the paper. On the other end is tacked a 3-ply bottom strip $1\frac{1}{2}$ in. wide, and the same width as the blackout paper (fig. 3).

It is advisable to drive large headed tacks through a strip of cardboard to hold the paper securely to the 3-ply bottom strip (see fig 3). The strip of cardboard should be 1 in. wide and 3 in. less than the width of the blackout blind.

Completion of the Blind. Details to cover the construction of this blackout blind have been dealt with above, and the next progressive stages are described here.

After completing the roller blind with the blackout paper and the $\frac{3}{4}$ in. wooden roller, as described previously, attach a length of fine cord or good quality string for operating the blind. The cord is attached to the disc end of the roller by means of a large-headed tack, and the cord should be about 6 in. longer than the length of the blackout paper.

It will be an easy matter to slip the bottom strip, together with the blackout paper, into the vertical runners and to insert the projecting nails in the ends of the roller on to the original blind



metal brackets. It may be necessary in some cases to remove the original brackets and place them farther apart to take the new blackout blind. If the blackout paper is very thick it may be necessary to place a piece of cardboard or 3-ply under the metal brackets to raise them the required distance from the window frame to allow the paper to roll up without obstruction.



IDEA FOR OPERATING BLACKOUT BLIND

The construction of some excellent types of blackout blinds have already been dealt with, and this article deals with the operation of them and gives a very simple and handy gadget which makes them very easy to adjust for day and night.

If the instructions in the previous article have been followed, when the blind has been inserted

SCOLU HOOK BLACKOUT BLIND

in the vertical runners, the lower edge of the blind will drop to the window sill of its own accord, and then it can be elevated by pulling the cord.

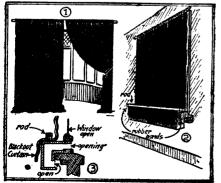
The free end of the cord can be threaded through a screw-eye near the top of the vertical runner to keep the cord in its position, and a small hook, on which to hang the looped end of the cord when it supporting the blind, can be driven into the lower end of the runner.

This type of blind is ideal for its purpose. It can be readily drawn up out of sight during the day time, and at night it can be lowered to blackout perfectly.

MASKING MULTIPLE WINDOWS

Multiple windows set on a curve are one of the most difficult problems in blacking-out a room. It is not possible to lay down definite rules; but, speaking generally, the simplest method is to hang black curtains to cover the whole window space.

The curtains should run on a rod set well above the window space, and should be large enough to overlap well at each end, and to drape on the floor. In the daytime either or both can be drawn aside. (See diagram 1.)



If the windows are in a straight wall and not on a curve it is not necessary to carry the curtain to the floor. It can reach to a few inches below the bottom of the window, and can be held down by a rod caught by rubber bands. The amateur carpenter can make a ventilator of the light trap variety to screw on to the window silf (see diagram 3) with the curtain fastening across the top of the ventilator.

Curtains will prevent pieces of glass flying into the room if bomb blast shatters the windows.

A USEFUL LIGHT LOCK FOR DOORS

Many doors ride high off the floor, and to trap this light, a piece of blackout cloth or blackout paper can be pinned to the bottom of the door.

Also, if you want to lighted porhouse to a dark portion b lackout. the opening of a door may light flow

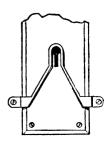
rooms

into which have not been blacked out. You can guard against this by keeping doors to all other rooms closed, or by screening lights even in the rooms which have been blacked out, or by making light traps to guard the doors. A light trap is handy at doors that open out of the house, though possibly not absolutely necessary if one bears in mind that a blackout is supposed to BE A BLACKOUT.

A light trap is made by hanging a lightproof A light trap is indee by haringing a light-curtain from ceiling to floor, or from wall to wall across the passageway, about 4 ft. from the door-way. The light nearest the curtain is then masked so that no direct rays fall on the curtain. To use the door it is then necessary only to pass through the curtain, and to allow it to fall back into place before opening the door. The screen on the lamp makes doubly sure that no light rays fall on the doorway.

A KEYHOLE YOU CAN FIND IN THE DARK This arrangement is a

useful on**e** especially outbuildina when any containing tools, etc., is required to be All tha kept that locked. needed is a little guide made from old scrap around the place and applied to the door without any change in its construction. The device is placed so that the diverging arms form a tapering passage through which the key will be guided to the keyhole.

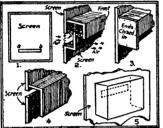


VENTILATION AND BLACKOUT

Summer warmth will increase the stuffiness of blackout sittingrooms and some sort of ventilation is worth considering. The question does not arise with bedrooms as the blacked-out windows can be opened or the black-out curtains drawn aside after the light has been put out for the night. (Keep a masked torch by the bedside).

There are various elaborate ways of making ventilators, but one very easy method is to make one of your window screens of plywood and to make a screened ventilation opening across the top or bottom of it. The window is then left open slightly, opposite the ventilator.

The ventilator is
made by
cutting a
slot "a-b",
3 in. from
top to bottom, almost
the full
width of the
screen. A
light trap is
built on to
the screen,
as shown in
the second
and third



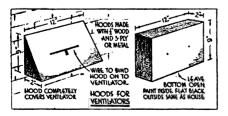
diagrams. The dimension "c" should be 3 in. Surfaces inside the light trap should be painted dull black, and the ends must be closed to prevent the escape of light.

A simpler form of ventilator—but one in which the slot in the screen must be narrower to prevent escape of light—can be made by making a slit opening in the screen and covering it on the inside of the screen with a narrow box with one large and one narrow side removed (see diagrams 4 and 5). Paint the inside of the box dull black.

If there is no fireplace in the room fit ventilators at top and bottom of the screen.

BLACKOUT HOODS FOR VENTILATORS

Most methods for blacking out ventilators necessitate plugging or covering the aperture in



such a way that it spoils the house ventilating system. Making hoods though will effectively black out and at the same time will not interfere with the efficiency of the ventilators.

The triangular hood is easy to make with 2 triangular end pieces of $\frac{1}{2}$ in. wood, on to which

is nailed a 12 in. x 9 in. piece of 3-ply wood or sheetmetal. The bottom and the back should not be covered. The hood should overlap the ventilator at least 1 in. all round. Drill 2 small holes through the front piece (see diagram), paint the inside with dull finish black paint, and the outside with a colour to match the house.

When dry, thread a piece of medium gauge wire through the apertures in the ventilator and the holes in the hood, and twitch tightly with pliers. The hood should be drawn in very close to the wall surface. If necessary plug the holes to prevent the escape of light.

The rectangular hood serves the same purpose as the other design. It is made with two 8 in. x 2 in. $x \frac{1}{2}$ in. pieces of wood, one 12 in. x 2 in. $x \frac{1}{2}$ in. piece, and a 12 in. x 2 in. covering of 3-ply or similar material for the front. You may have a small wooden box of suitable dimensions to use as a hood.

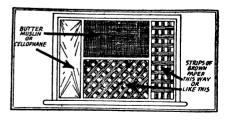
GLASS SETS A PROBLEM

One of the greatest potential dangers against which the civilian must protect himself and his family during an air raid is that of flying splinters of shattered glass. Bomb blast and suction can shatter windows hundreds of yards from the place where the bomb falls and, short of barricading the windows with sandbags, little can be done about it.

It is, however, possible to treat the window panes so as to minimise the flying of fragments of glass into the room. There are various methods of treating the panes, and arguments in favour of and against each.

Heavy curtains of blackout material will serve the double purpose of blacking out the window and catching any flying pieces of glass.

Blackout paper, if stout enough and close enough to the glass, would probably stop flying pieces, but this is by no means certain.



Stout paper pasted to the glass would prevent it from flying, but would have the disadvantage of blacking out the room during the day and not at night. Strips of stout paper—such as good brown paper—pasted in the form of a lattice to cover about 50 per cent. of the area of the glass (see diagram 1) have proved reasonably satisfactory, but obviously not so good as paper pasted over 100 per cent. of the glass. Heavy cellophane can be used, but it must be heavy.

Any transparent or semi-transparent material such as cotton, muslin, celophane or linen sheeting can be pasted over the glass and on to the wooden frames. Coat the glass with clear varnish, press the material on to the glass, and then apply a second coat of varnish over the material

Another method is to paste strips of paper, adhesive tape or celophane on to the window in criss-cross patterns. Squares of uncovered glass should not be larger than 4 inches by 4 inches.

The best method of all seems to be to paste old lace curtains or strips of butter muslin on to the glass. Some householders have found flour paste satisfactory, but a paste with a stronger base is recommended. With a little care and imagination the pieces of lace curtain can be arranged so as not to spoil the appearance of the window, perhaps even to enhance it.

Windows left slightly open stand a better chance of surviving.

The object of these precautions is NOT to prevent the glass from breaking, but to prevent it from shattering into small flying fragments.

OTHER WAYS OF MAKING WINDOWS SPLINTER PROOF

Amongst the various methods which can be adopted is that of a screen of double layers of $\frac{1}{2}$ in. mesh wirenetting, 2 or 3 layers of fly-



USING A FLOUR PASTE AND 5% OF GLYCELINE OR TREACLE, STICK ON TO THE MISTOE OF WINDOW, PIBCES OF CLOTH, OLD CURTAINS OR TOUGH PAPER TO PREVENT PRYING CLASS SPLINTERS

ANOTHER METHOD IS TO FIX ON TO THE INSIDE OF THE WINDOW FRAME A SCREEN OF \$ MESH WARE HETTING OR STRONG FLYWIRE A SHEET OF 3-PLY, FIGRE, PULP BOARD OR SHEET STEEL

FIXING CLOTH ON WINDOW

wire, or sheets of 3-ply, thick cardboard, or sheet steel fixed securely with nails or screws to the window frames.

If protection is desired in the room, the protective material should be on the inner surface of the window, but if it happens that you require protection on the outside, the covering should be on that side.

Such material as 3-ply or thick card nailed to the window frame, as well as splinter-proofing the windows, will also fulfil blackout require-

As previously indicated, certain materials such as muslin, close mesh lace curtains (not in a perished condition), thin cloth, or tough paper, are ideal for pasting on to the inside of the

A thick flour paste can be prepared window. A trick flour paste can be prepared into which is mixed 5 per cent, of glycerine or treacle to make it tacky. Then cut the material to size, and give it, or the window pane, a coat of paste; press the material on to the window, and roll or paste it out flat.

CARRYING CASE FOR A.R.P. EQUIPMENT

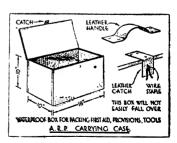
Many pieces of A.R.P. equipment such as a packed in a handy type of carrying case so that the case and its contents can be picked up at a moment's notice, and, if you have given due consideration to the packing, you will know that no essential article has been forgotten.

A box, approximating the proportions of the sketch will prove to be a convenient size for most requirements, but if you wish a suitcase can be used for the purpose. One with square can be used for the purpose. ends will not be easily tipped over, and also it will hold a good amount of equipment.

Make the case with half-inch wood by first nailing the 4 upright pieces together, and then nail on the 18 in. by 11 in. bottom piece. The lid, measuring 18 in. x. 11 in., can be fixed on with 2 in. x. ½ in. flap hinges, or else pieces of soft leather tacked to the lid and the box can form hinges. On the free edge of the lid fit a leather catch or a lock of some description. Also you can tack down a 7½ in. x. 1 in. strip of leather to form a handle on the top of the case. You should make the case waterproof by good construction and painting. by good construction and painting.

If you wish, the case can be divided into compartments to hold special items.

The first aid equipment should include tannic acid jelly for burns, cotton wool lint, adhesive plaster, clean soft cloths for bandages and slings, sal volatile, antiseptic, safety pins, and scissors. Most of these things could be packed in an airtight jar to prevent contamination.



For a provisions reserve you could pack chocolate in the tins, biscuits, dried fruits, nuts and bottles of water, while a hammer, hacksaw, pliers, snips, rope, and nails can comprise the tool kit.

Also you should include a torch, newspapers. dark glasses, candles, matches, towel, mirror, cut and knife.



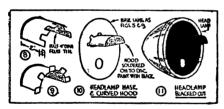
HOW TO BLACK OUT YOUR CAR LIGHTS

Effective screening of car lights is of the utmost importance under either brown-out or black-out conditions, and the following suggestions regarding various methods of doing this yourself might prove useful to many.

Globes should be removed from interior car lights or those that illuminate the boot or steps. Cover the reflectors of parking, tail, and stop lights with black paper. Insert two thicknesses of newspaper behind the glass of parking, tail, and stop lights, and black right out with paint the white or red side and top panels of the rear lights and parking lights.

The most effective pattern has proved to be a slotted mask with a projecting hood as indicated in the following illustration, although there are and have been other temporary measures as given in the following paragraphs.

The mask shewn in this column has a curved hood and is an excellent type and is the one recommended for all purposes. It completely screens the lights from the air, and once it is installed in its correct position you need have no further worries.



The construction of the back of the mask is similar to that of the flat-hooded type which is explained on the next page. However, on the

front a semi-circular hood is in this case substituted for the flat hood.

With tin snips or old scissors, cut a 4 in. diameter preserved fruit tin in halves, then cut the length down to 2½ in., cut the lugs as shewn in fig. 8, and bend them over at right angles (fig. 9). This enables the hood to be soldered on to the front of the mask (fig. 10). The bottom edge of the mask should be on a level with the centre of the aperture.

The mask can be painted in the same way as the flat-hooded variety. When the mask is in position, test the angle of the headlamp to make sure that the rays of light are directed correctly on to the road surface.

It is really not necessary to do anything to parking globes that are inside the main headights provided they do not exceed 3-candle power, and provided the headlamps have been blacked out in accordance with the advice given in these columns.

A TEMPORARY METHOD OF MASKING CAR LIGHTS

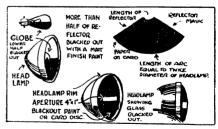
As mentioned, the method shewn in the foregoing column is the one recommended but, as a temporary measure for immediate use in what is termed a brown-out only, the easiest of arrangements is as shewn in the following set of drawings. These details are given merely as a guide to those who wish to follow this method temporarily, but actually the A.R.P. authorities favour the other ideas.

One procedure indicated here is to remove the head-lamp glass and paint all the inside surface with the exception of an aperture approximately 4 in. x 1 in. across the glass just below the centre.

Special paint for this purpose can be purchased, or else you can use black lacquer, black enamel, black household paint, or any quick-drying waterproof paint. The paint should be fairly thick, otherwise more than one coat will have to be applied to make a dense, non-transparent covering. You will also need a couple of square feet of paper with a black surface.

The lower half of each electric bulb and more than the lower half of each reflector must be coated with blackout paint (see sketch). Instead of painting the reflectors, which may cause damage to the plating, you could cut a mask from a piece of mat surface, thin card, or paper to the shape shewn on the top right hand corner. The mask can be wedged into the back of the headlamp, while the rim will hold the front edge. Headlamps should not exceed 7 watts.

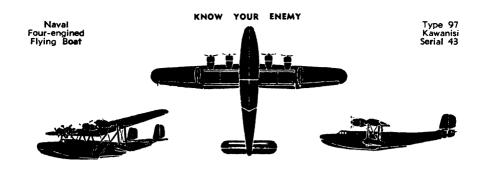
If the headlamp glass is flat, you can cut a disc of black card slightly wider than the glass, then cut a strip $1\frac{1}{2}$ In. deep across the centre of the disc. Insert the disc behind the glass so that the slit is horizontal.



If the headlamp glass is curved, paint the upper and lower halves (on the inside) so as to leave a strip 1½ in. deep across the centre. This requires care and patience to prevent the paint from running and to get it thick enough to stop al! light.

Some people also blacken the end of the inside globe of the headlamp in order to reduce the light showing.

These methods of screening are allowable, but they must be done properly.



A FLAT-HOODED MASK FOR CAR LIGHT

Experience has taught that the most effective means of black-outing car light is by means of the metal mask, and these are illustrations of the flat-hooded type.

First, with tin snips or old scissors, cut out a metal disc (fig. 1) to replace the glass in your headlamp and then, using an old chisel, cut out a 3½ in. x ½ in. aperture and a 1 in. hole in the position shown in fig. 1. If necessary, file the edges to a smooth finish. The 1 in. diameter hole allows a very diffused light to penetrate, and thus warn pedestrians of the approaching car, and to indicate the width of the proaching car, and to indicate the width of the car to other motorists.

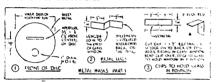


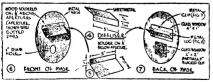
Figure 2 gives dimensions for the 5 small strips of sheet-metal which form the lugs to support 2 pieces of glass (see second half of this article). With pliers they can be bent to the shape shewn.

Also you can cut out 2 clips (fig. 3) measuring 1 in. $x \ge 1$ in. to hold the pieces of glass in position.

Completion of Flat-hooded Mask.—With the 5 lugs and 2 clips prepared, you can mark the positions they should occupy on the back of the metal disc. One clip and 2 lugs are arranged to hold the 4 in. x 1 in. glass window over the aperture, and one clip and 3 lugs are used for the 2 in. x. 2 in. piece of glass over the 1 in. hole. The clips are bent over after the glass has been inserted in the lugs.

Then you can cut out the 5 in. x 1½ in. metal diffuser (fig 4), bend into shape, and solder on to the back of the disc ½ in. below the aperture (fig. 7). The diffuser prevents the direct cays from the globe passing through the aperture.

rays from the globe passing through the aperture.



The hood (fig. 5) is cut out and bent in exactly the same way as the diffuser, and is soldered to the front of the disc $\frac{1}{2}$ in. above the aperture (fig. 6). The angle of the hood depends on the position of the headlamp, but generally the bottom edge of the hood should be level with the bottom edge of the aperture (see fig. 6). After testing to obtain the correct angle for the hood, if you wish you can solder small triangular end pieces between the hood and the front surface of the disc to reinforce the construction.

The 2 in. square of glass, which covers the 1 in. hole should be given a thinnish coat of blackout paint, and when it is dry test it for density by assembling it temporarily in its required position. If the glow is too bright, give it another coat of paint.

With the construction complete give all the metal parts a good coat of waterproof matt-finish black paint, fit the 2 pieces of glass into the back of the mask by means of the lugs and clips, and fix the mask in position on the head-lamp where it is held securely by the rim. When fitting, it is advisable to cut a ½ in. band of rubber or cork, or slit a length of rubber tubing, to place over the edge of the mask to serve as a gasket between the edge of the lamp and the mask. Also, cork packing can be placed be-tween the glass windows and the metal disc to prevent rattling and breakage.

SCREENING THE TAIL LIGHT OF YOUR CAR The easiest way to screen the tail light is to dismantle the rim to free the glass, and then to

CLASS PANEL BLACKED OUT WITH PAINT PAINT OUT OR SCREEN WITH CARD ALL OF GLASS EXCEPT A L½" DIAM. CIRCLE FOR TAIL LIGHT, AND A I" DIAM. CIRCLE FOR STOP LIGHT

GIVE BOTH LIGHT BULBS A CONT OF BLACK PAINT, ESPECIALLY STOP LIGHT TO REDUCE GLARE TAIL LIGHT BLACKED OUT

the stop light. The coating thick, so that the light will not penetrate. thick, so that the light will not penetrate.

It will be a wise plan to either replace the stop light globe with one of lower candle-power, or else you can give the globe a thin coating of black-out paint to reduce its intensity. If the tail light globe is excessively bright, also give it a thin coat of paint. The glass panel at the top of the tail light should be completely blacked out.

paint the nner

face of the

glass, with the excep-tion of a

1½ in. aper-

ture for the

tail light and a 1

d i a meter opening for

sur-

in.

Parking lights which have a convex glass can have the globe removed or the glass completely blacked out with paint. If the glass is flat, the lights can be treated in exactly the same way as blacked-out headlamps, except that the aperture must be very small.



Metal to be soldered must be free from rust and grease. First, the tip of the soldering iron must be coated with solder. To do this, heat the

soldering iron until nearly red-hot; file the tip clean, then melt a spot of solder on a piece of sal-ammoniac and rub each surface of the iron back and forth. The solder will adhere to the tip of the iron and be ready for the work.



FIRST AID IN DIAGRAM

PRESSURE POINTS YOU SHOULD KNOW

With simply acquired knowledge and a cool head, you can easily stop bleeding that might otherwise result in loss of life within a couple of minutes. All you need is a little care and a little elementary knowledge.

a little elementary knowledge.

If the bleeding is bright red; if it spurts out to correspond with the pulsations of the heart, and flows from the side of the wound nearest the heart, you will know that AN ARTERY has been severed, and it must be stopped at once. Some direct pressure should be applied on a pressure point between the wound and the heart to stop the bleeding. This illustration shows the various pressure points, that is, the points where an artery can be pressed with the thumb or the fingers against a bone or cartilage to cut off the supply of blood. This may allow a clot to form and thus stop bleeding; a dressing firmly bandaged over the wound will then be sufficient.

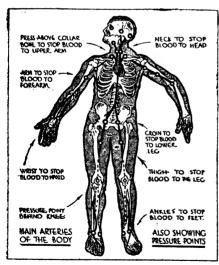
If an artery has been severed in or above the

If an artery has been severed in or above the throat, the pressure should be at the throat, pressing from the front against the spine just to one side of the windpipe. A second pressure can also be effected above the bleeding point to stop the blood flowing from the jugular vein.

Three Pressure Points are Most Important

(1) To control bleeding from the shoulder or

(1) To control bleeding from the shoulder or arm, press deeply downwards behind the centre of the collarbone with the thumb.
(2) To control bleeding from the lower part of the arm, grasp the upper arm from behind with the fingers on the inner side; press the flat not the tips of the fingers firmly against the bone of the arm.



(3) To control bleeding from the leg, pressure should be placed on the centre of the groin against the pelvis with one thumb over the other and the injured leg should be raised as shown in another illustration. Keep the pressure up without ceasing till the Doctor comes.

For bleeding other than arterial bleeding, just bandage a dressing firmly over the wound. If the bleeding is from the leg, or arm, make the patient lie down and raise the limb as high as

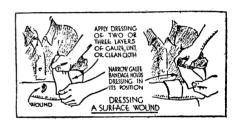
For bleeding from the nose, make the patient lie down on his side with the head on a high pillow. Apply cold, wet cloths to back of neck.

HOW TO DRESS A SURFACE WOUND

The dressing of a surface wound is a comparatively simple matter, but it is important not to touch with the fingers any part of the wound, or any portion of the dressing that will make contact with the wound. You should consider the fingers always more or less contaminated with germs, unless they have just previously been washed in an antiseptic solution.

You should be careful to remove foreign bodies from the wound and, if the wound is very dirty, wash with sterilised or fresh boiled water, an wash with sternised or flesh boiled water, antiseptic, or a saline solution (I teaspoon salt dissolved in I pint of boiling water). I should always wash away from the wound. there is any possibility of contamination with tetanus germs, medical advice should be sought regarding an antitoxic injection.

Over the wound you should place 2 or 3 layers of perfectly clean gauze (sterilised for preference), lint, or a folded handkerchief, which



should be held in place with a few turns of gauze bandage or another handkerchief.

If you wish, an antiseptic lotion can be applied to the wound, but you should not apply ointment because of likely germ infection. Try to avoid exposure to the air longer than is necessary.

Clean dressings can be prepared by washing and boiling pieces of soft cloth for at least 20 minutes; then wash the hands thoroughly, and iron the cloths with as little handling as pos-

INTERNAL BLEEDING

If anyone is hurt internally, there may be indications as to where the injury might be. For instance, if blood is coughed up and is bright red and frothy, it will indicate that the LUNGS have been injured.

If the blood is at all coffee-coloured, it will probably be vomited up from the STOMACH and if the BLADDER is injured, the patient may not be able to pass water, or if he can, it will probably be stained with blood. The latter might also indicate injury to THE KIDNEYS.

Injury to the LIVER and INTESTINES do not bring up blood but it will cause swelling.

Injuries to the liver and intestines are usually accompanied by signs of severe shock—a cold accompanied by signs of severe shock—a cold clammy skin, pale face, and shallow breathing, possibly yawning. The patient should be kept as quiet as possible. Keep him lying as comfortably as possible; loosen clothing at the neck and waist, and wrap him warmly in rugs. Give nothing at all to drink. Call for a Doctor or get him to hospital as soon as possible.

HOW TO APPLY A TOURNIQUET.

Firstly and very important, a tourniquet should not be applied at all unless as a last resort—
the first aider should become familiar with pressure points to keep the blood back from a severed artery but, if that is not possible for any
length of time and the wound is of a very serious nature and bleeding not easily withheld, it can then and then only be applied.

The tourniquet is simply a form of ligature, which can be twitched to apply the necessary pressure on a pressure point to hold back the flow of blood. It is most important not to apply a tourniquet unless it is important. More home the property of the pr harm than good has often been done in this way.

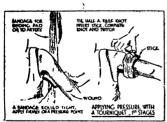
The first diagrams show the first stages of the application. A bandage should be rolled tightly to form a compact pad. Place it right on the pressure point on the limb near to the wound and on the heart side. Secure the pad there with a second bandage, which is tied with



a half reef knot on the opposite side of the wound; lay a stick on the half-knot, and complete the reef knot.

It has been shown how a pad should be placed on the pressure point with a bandage to hold it in position. As the reef knot is being tied, a short stout stick is inserted in the knot, and this stick is twisted until sufficient pressure is applied to hold up the flow of blood from the wound. Do not twist more than is necessary.

Then you should place a turn of another bandage around the free end of the stick, and tie the bandage around the arm to prevent the stick from twisting back.



It is important to release the tourniquet every 15 minutes to prevent damage to the nerves and the structure of the limb. You should never leave a person unattended while a tourniquet is leave a person unarrended while a rournique is on, in case fainting should develop. If the bone in the limb is not broken, elevate it until bleeding ceases, and then, in the case of an arm wound, the limb can be placed in a sling. As it is not possible to fix tourniquets on presented the property of t

As it is not possible to fix tourniquets on pressure points other than limbs, you must rely on finger pressure, or a special form of ring pad, if the wound is on the head.

Usually a dressing held very firmly on a minor wound will cause the blood to clot, and thus arrest the bleeding, but this method must not be relied on if the flow of blood is vigorous and full.

and full.

HOW TO "BLANKET" A STRETCHER

The "blanketing" of a patient on a stretcher should be done in certain definite ways. The larger of the two diagrams given below shows how to use 2 blankets and the other one 3 blankets and the blankets cannot then be very easily disarranged. We will explain the larger one of the two.

If you fold the two large blankets into 3, it will be an easy matter to arrange them on the stretcher. The middle third of the first blanket should be placed on the stretcher with one-third





hanging down over each side. The second blanket has one - third over the s tretcher and twothirds han ging down one

TWO LARGE BLANKETS STRETCHER ETCHER STECIALLY PARLD OR CAN IMPROVISED WITH NES AND CANVAS 2) 2NO STAGE 1 IN LIVE TWO PHICEDRESSES OF FOUR THICKNESSES OF BLANKETING A STRETCHER (3) FINAL STAGE

side. Then the free onethird of of n e first blanket folded back the OVER stretche (fig. 2) and then second blanket is folded over. The patient can be lifted on to

the stretcher and covered with the 3 free ends of the blankets as shown in fig. 3.

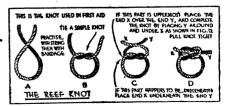
The usual method for lifting a patient on to the stretcher is for 3 bearers to kneel on the left side of the patient, and then to carefully raise the patient on to or up to the height of the knees. Another bearer pushes the stretcher under the patient, so that he be cently lowered. under the patient, so that he be gently lowered on to it.

HOW TO TIE A REEF KNOT

This knot is important and, with practice, is simple to apply. It will not slip when strain is applied, and is in contrast to the "granny" (shown here) which will not hold. The usual explanation of tying right over left, then left



over right, can be easil v misunderstood, but a study



of these sketches will assist. Using a piece of cord, go through the stages shown; watch each movement carefully and you will soon be able to do it blindfolded. Note the way the light portions of cord, as well as the dark portions, come out on the same side of the loops in the knot. Practice with bandages.

HOW TO LIFT HEAVY WEIGHTS

This illustration depicts an excellent idea that may be the means of saving a life. If a person is pinned under a heavy weight, such as a collapsed trench entrance, the wall of a building, or a slab of concrete, it is possible to raise that heavy weight by means of a long pole and a block of wood.

Push the end of a long pole, or an iron bar, under tha



lifted, place a large block οĒ wood under the pole as object as is possible and exert pressure or your full weight on the free end of the

object to be

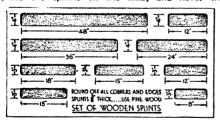
Usually the object can be easily but if it is impossible to make a movement, you must either push the block nearer to the object or obtain a longer pole. With the object raised sufficiently, a block of some description can be placed under it by another person to hold it in that position until the rescue is effected.

HOW TO MAKE A SET OF SPLINTS

A suitable set of splints for average requirements can be made with 3/8 in, wood of the dimensions given in the diagrams but it you additional splints can be prepared. The wish, additional splints can be prepared. The splints for the arm should be 3 in. in width, while the leg splints should be 4 in. It is advisable to round off all corners and the sharp edges with a rasp, and then all surfaces can be smoothed with sandpaper.

When a bone is broken, it is referred to as a fracture, and the first-aider's obligation is merely to provide a support in the form of splints, to prevent complications developing.

The splints should be fitted firmly, and should be long enough to extend above and below the joints on either side of the fracture. Always place the splints on the limb, and never the



limb on the splint. If necessary, they can be fitted over the top of the clothing. If no splints are available in an emergency, you can walking use such articles as broom handles, sticks, pieces of wood, an umbrella, tightly folded newspaper, cardboard, or anything that is firm and long enough to provide adequate support.

If no splints are available, place a broken arm in a comfortable position against the body and bandage it firmly in this position; tie a broken leg firmly to the good leg. If a patient is seriously injured do not waste time tinkering with him. Place him gently on a stretcher and get him to hospital as quickly as possible.

BANDAGES AND BANDAGING

HOW TO PREPARE TRIANGULAR BANDAGES

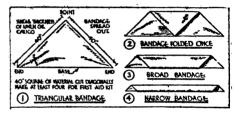
The triangular bandage is one of the most important items of equipment in the first-aid kit. It is used mainly to hold dressings in place, to protect the injured part, to keep splints firmly in position, to afford support to an injured limb, and to make pressure and thus pre-

vent or reduce swelling.

You can make 2 triangular bandages by cutting a 40 in. square of clean cloth material, such as linen or calico, from corner to corner. You should prepare at least 4 of these bandages. The long edge is called the base, the opposite corner is the point, and the other 2 corners are called ends

Scrietimes, as in the case of a sling, the bandage is used open, while for certain other purposes the point of the bandage is brought down to the centre of the base (fig. 2), and is folded over again to form the broad bandage (fig. 3).

A narrow bandage (fig 4) is made by folding A harrow bandage (rig 4) is made by rolumy the broad bandage once. When not in use the bandage should always be carefully folded narrow, with the 2 ends turned into the centre, and bandage folded into 4, to reduce it to a shape measuring approximately 6½ in. x 3½ in.



THE LARGE ARM SLING

This sling is used to support the arm where the injury is below the elbow. It is easy to apply

and allows the injured arm to relax.

A large triangular bandage should be spread over the front of the patient as shown.

patient should bend his injured arm at right angles, and support it across the body. Then place one end of the bandage over the shoulder on sound side, the and pass it around the back of the neck to rest on the shoulder of the injured side.

The lower corner of the bandage is pulled up over the arm

up over the annext to the shoulder, where the two corners are tied together with a reef knot. The knot should rest in the hollow just above the collar bone. The surplus bandage at the elbow, can be tucked in between bandage and elbow,

can be tucked in between bandage and elbow, and fixed there with a safety pin.

It is important that the tips of the patient's fingers should be free beyond the end of the bandage. In the event of a bandage not being available, the coat sleeve in which the injured arm is placed can be pinned. to the coat, or else the lower edge of the coat can be turned up and pinned above the forearm, or the hand can be pushed into an unbuttoned portion of the vest.

BANDAGING.

The triangular bandage plays a very important part in First Aid Treatment and is mainly used for holding splints in position, to support and injured part and to reduce any

swelling.



THE SMALL ARM SLING

This is a bandage which is made along somewhat similar lines to that shown in the previous para-

graph, except that it is made by folding the bandage broad as indicated in fig. 3 of the sketch in the preceding column under "How to prepare triangular bandages." It supports the wrist, and

dages." It supports the wrist, and, same time, allows the elbow to hang First of all, place one end of this banthe same time. freely. dage over the shoulder and then pass it around the neck. Then place the wrist over the centre of the bandage and raise the other end in order to tie same near the neck as shown.

THE ELEVATED SLING FOR FOREARM AND HAND

This of type sling is intended to keep the hand well raised, more or less as indic-ated in the lefthand illustration. When a collarbone is broken it advisable to also insert a rolled pad of mate-rial, say 4 in. x 2, and place it in the armpit on the injured side. Then complete the





For Fractured o i i a rbone, Fractur-e d Shoulderblade or severe hand bleeding.

bandage allowing the knot to rest in the hollow just above the collarbone.

Injuries of this nature should receive early medical attention for the purpose of setting the bone in its correct position.

THE CHEST, BANDAGE



Place the bandage firmly over the dressing with the point over shoulder on the the same side; then fold a hem along the base of the bandage, carry the ends round the waist and tie

them, leaving one end longer than the other; then draw the point over the shoulder and tie it to the longer end. The illustration should give you an idea as to the finished bandage. For the Back, the bandage is applied in the same way except that it is begun at the back.

ELBOW AND KNEE BANDAGES Such ban-



Elbow

Knee

dages will fold over both the knee and elbow and yet give a little play so that some movement of

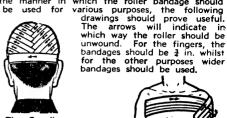
them can be obtained. When commencing these bandages bend the elbow and knee a little so that this little movement can be allowed for.

THE ROLLER BANDAGE AND ITS APPLICATION

For those who are not well conversant with the manner in which the roller bandage should



The Capeline Bandage for the Head.



The Spica Bandage the Shoulder. for







Spica Bandage for Groin or Hip.

Bandage for the Forearm and Hand. Figure 8 Bandage for the Hand. Spica Bandage for the Thumb.



Spiral Bandage for the Fore-Arm.

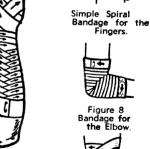




Figure 8 Bandage for Foot or Ankle.



Figure 8 Bandage for the Leg.

BANDAGING

These illustrations will show clearly how to apply to the head. In this connection all dressings should be completely covered by the bandages to prevent them from moving.





For the Scalp. it is necessary to protect the scalp with a bandage, or to keep a dressing in place, you will find it easy to keep in place if applied in the way shown. The face is shown. The face is not covered in any way.

First make a 1½ in fold along the long base of the triangular bandage. Place the middle of the folded edge across the forehead just above the eyebrows, and allow the remainder of the bandage to rest across the top of the head with bandage to rest across the top of the head with a sindicated. Then bring each of the two free ends right on round the back of the head above the ears as shown in the first sketch, tying them together in the centre of the forehead with a reef knot.

The point of the bandage hanging down the back can then be lifted up over the top and fixed to the rest of the bandage with a safety pin.

Face and Head Bandage (the Bridal Bandage). This, too, is simple. For a wound on the head or face, it is generally necessary to apply over the wound a dressing

and then a bandage to keep it in place. If injuries are on If injuries are on certain parts of the forehead, the cheek the chin,, the top of the head, or back or the head, a face and head bandage can be





applied. This requires a fairly narrow bandage.
The middle third of the bandage should rest
on the injured side of the face and then the free ends on the sound side can be crossed (see first sketch) and carried round the head.

They are then tied where they cross each other at the side of the head-this is the most comfortable place for the injured person. bandage then serves as a pad for the knot, and it will keep dressings on various parts of the head.

Eye Bandages. If





eyes are injured it is necessary to them, first bandage them, first place a pad or dressing over the injured eye, and then fold bandage as indicated in the drawing-tying it over the dressing. See that it is firmly

fixed on without causing inconvenience. Other useful Head Bandages. There are quite a number of other bandages which can be applied for various parts of



Bandage

for side

of head.



For instance, the Four-tailed side of the head, as Band age for shown on the left, any part of is a somewhat simi-

shown.

the head-some of them being along similar lines to the eye bandage already

head. lar type, whilst that on the right is on similar lines to the fourtailed jaw bandage given in the next sketch.

BANDAGING

What is known as the four-tailed bandage is shown here. illustration is self-explanatory and it provides a very it provides a secure and excellent support for such a thing as a broken



Four-tailed Bandage for jaw.

Each of the four tails are brought together and knotted in the places shown.







These four illustrations comprise the following:-

Top Left: Bandage for fracture of Lower Jaw, in which two bandages are needed. in which two

Top Right: Band-age for the Forehead which is somewhat similar to others similar to others shown at the bottom of the preceding column.

Bottom Left: A ring pad used to relieve pressure where a pressure fracture or a foreign body is suspected.

Bottom Right: bandage for the Eas.

HOW TO TRANSPORT INJURED PERSONS

The Human Crutch. If a person is weakened or injured, but is able to walk to some extent, you can assist by taking one of the patient's arms over your own shoulder, and grasping him around



the waist with your other arm. Incline your body a little away from the patient so that you can take as much weight as possible off the patient's legs. The legs nearest to each other should keep in step. When this method is used the rate of walking will be slow.

It is best to stand on the injured side if possible.

The Pick-a-Back Style. This is another simple method for carrying an injured person, but a very heavy person will impose much strain on the carrier. It is necessary for the patient to hold on to the shoulders and the carrier will not be able to keep the patient under observation. Therefore this method should be used only for certain



The Cradle. This is a lift suitable only when carrying children or very light In this, the arms patients. must be passed well under the patient before commencing to lift.



THE DOCTOR COMES

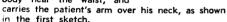
TRANSPORTING INJURED PERSONS

The Firemen's Lift. The Firemen's Lift is an excellent idea for carrying an unconscious person, who must be moved without delay. It is a method often used in the last war,



rrying an unconscious person, who must be moved without delay. It is a method often used in the last war, and only one carrier is necessary. As one arm is then free, it is possible to carry the patient along a narrow passage or down a ladder with safety.

The patient should lie face downwards, and the bearer stoops opposite the patient's head to raise the patient to a kneeling position. Then the bearer places his own shoulder against the patient's body near the waist, and



The bearer should then rise slightly, place his right arm around or between the patient's thighs, grasp the patient by the right wrist, and rise to a standing position. Then the patient's right arm can be held as illustrated. The bearer's left hand will be free to grip a ladder or to steady himself as he goes along.

HAND-SEAT METHOD OF TRANSPORTING INJURED PERSONS

The Two-Handed Seat. There are times when it is necessary to rapidly transport an injured person from one place to another place of safety and comfort, and it is at such times that hand-seat methods can be adopted. If



(1) THE HOOK-GRIP used for

such times that nand-seat methods can be adopted. If you have sufficient practice, you will not then hesitate as to what should be done at a critical moment.

The two-handed method is

generally used when two to carry a patient who has and thus cannot assist to support himself. The carriers (one on each side of the patient) face each other, and then stoop. They place their nearer forearms across the patient's back just below the shoulders, and on raising the patient into a sitting position they pass their free arms under the patient's knees. Here the hands are gripped together as shown above.

The carriers rise together, and step off with opposite feet, so that jolting movements are reduced to a minimum. If a folded hand-etween the gripped finger.

kerchief is placed between the gripped fingers, the strain will be reduced.

The final carrying position is shown in the lower sketch.

The Three-Handed Seat. The three-handed seat is an alternative method to replace the four-handed seat, but it has an added advantage for the person with an injured leg, or who can sup-





(3) Grip for THE FOUR-HANDED SEAT (3) THE THREE-HANDED SEAS

port himself with only one arm. The free hand of one of the carriers can be placed around the back to steady the patient or

else an injured leg or arm can be supported to reduce strain.

The method of clasping hands is very similar to the four-handed idea, except that the carrier on the injured side of the patient uses only one arm for the seat. The carriers should stand face to face behind the patient, and then clasp three hands on to the wrists as shown.

As the carriers stoop down, the patient should, if the arms are not injured, place them around the shoulders of the carriers, and help to lift



himself on to the hand seat. The carriers rise together, and step off with opposite feet. If necessary a pad or cushion can be placed on the carriers' hands before the patient settles down.

The lower left-hand drawing shows the three-handed seat, with one of the bearer's arms supporting the patient from the back.

The Four-Handed Seat. This is one of the simplest methods for carrying a person who is able to be transported in the sitting position. Of course, these methods are only useful for carrying up to 100 yards or so—a stretcher of, say, an improvised type is the recognised way of taking patients over long distances or of carrying patients who are seriously injured.

The four-handed seat can be resorted to when a person can place both arms around the shoulders of the carriers to help support himself.

The carriers face each other behind the patient; they join hands on to wrists (as shown in the illustration), and then stoop down. The patient is then instructed to place his arms over their shoulders, so that he can assist to raise himself. The carriers rise together and step off with opposite feet.



The illustrations given on the left of this paragraph show the front view of the four-handed seat (top), showing the position of the patient and the manner n which the carriers transport im and the way in which he nakes himself comfortable by putting his arms round their necks.





WAR GASES

1 month, depending upon intensity and conditions). 29 29 29 29 29 29 29 2	S ON THE BODY	EFFECTS ON THE I	HOW RECOGNISED	CLASSIFICATION	GAS	
LEWISITE Very persistent. Crude state: Smell of geraniums. Pure state: No smell. Immediate stinging of skin. Detectors turn red on contact. D.M. Non-persistent. Pain in chest teeth, and forehe feeling of influer sion, vomiting. D.A. Non-persistent. D.C. Non-persistent. White solid, as for D.M. Let D.M. Pinkish white solid, as for D.M. C.A.P. Non-persistent. Grey crystals. Recognised by effects. K.S.K. Persistent, two hours Affects eyes. Persistent, 3 to 30 dour of sour fruit. As for C.A.P., Effects eyes. PHOSGENE Non-persistent. Mortal Morsible. Non-persistent. Mortal Sight persistent. Smell of musty hay. Coughing, changes to bluis cease temporaril 24 hours. As for Phosgene Market Liquid vaporises. Smell of musty hay. Liquid vaporises. As for Phosgene.	er 2 hours. Blisters in If swallowed, pain in initing, and death. is—Pain and redness. Temporary blindness. seness, after 6–8 hours, monia. Skin—Redness after 12 hours. Blistanter 12 hours. Blistanter 15 hours.		oily liquid. Smell of garlic or onions. On contact, detec-	few hours up to 1 month, depending upon intenstiy and	MUSTARD GAS	R GASES
LEWISITE Very persistent. Crude state: Smell of geraniums. Pure state: No smell. Immediate stinging of skin. Detectors turn red on contact. D.M. Non-persistent. Persistent. Non-persistent. D.A. Non-persistent. D.C. Non-persistent. C.A.P. Non-persistent. C.A.P. Non-persistent. B.B.C. Persistent, two hours As for C.A.P., English of pear drops. Affects eyes. PHOSGENE Non-persistent. Mon-persistent. DIPHOSGENE Slightly persistent. Crude state: Smell of geraniums. Pure state: No smell. Immediate stinging and estinging, redness Bisters in 1 hm may lead to deapoisoning. Pain in chest teeth, and forehe feeling of influer sion, vomiting. As for D.M. Let D.M. Pinkish white solid, as for D.M. Let D.M. Pinkish white solid, as for D.M. Let D.M. Pinkish white solid, as for D.M. Mon-persistent. Grey crystals. Recognised by effects. Stinging pain in flow of tears. Sight irritation face. As for C.A.P., English brown liquid. Smell of pear drops. Affects eyes. PHOSGENE Non-persistent. Montal May and the persistent. Smell of musty hay. Coughing, choranges to bluis cease temporaril 24 hours. As for Phosgene. Smell of musty hay. Liquid wapprises. As for Phosgene.	tion of nose and lungs. 1–2 hours. Blisters in	Violent irritation of nose a Redness in 1-2 hours. I 4-8 hours. Effects s	smell. Extreme irrita-			BLISTER
Effects in 3–5 min. teeth, and forehe feeling of influer soin, vomiting. D.A. Non-persistent. White solid, as for D.M. D.C. Non-persistent. Pinkish white solid, as for D.M. C.A.P. Non-persistent. Grey crystals. Recognised by effects. K.S.K. Persistent, two hours Reddish brown liquid. Smell of pear drops. Affects eyes. PHOSGENE Non-persistent. Mortal Non-persistent. Mortal Smell of musty hay. Coughing, changes to bluis cease temporaril 24 hours. As for Phosgene Market Nortal Non-persistent. Smell of musty hay. Liquid vaporises. As for Phosgene Market Nortal N	of eye 1 hour. Per- ness. Skin—Immediate dness in 15 minutes. I hour. If swallowed.	Liquid: Eyes—Intolerable ness, closing of eye 1 h manent blindness. Skin—stinging, redness in 15 Blisters in 1 hour. If may lead to death, due	geraniums. Pure state: No smell. Immediate stinging of skin. Detectors	Very persistent.	LEWISITE	
C.A.P Non-persistent. Grey crystals. Recognised by effects. K.S.K. Persistent, two hours Reddish brown liquid. Smell of pear drops. Affects eyes. Persistent, 3 to 30 dour of sour fruit. As for K.S.K. Phosgene Non-persistent. Mortal Nortal. Smell of musty hay. Coughing, chaptes to bluis cease temporaril 24 hours. As for Phosgene Market Liquid vaporises. Smell of musty hay. As for Phosgene As for Phos		Pain in chest and thro		Non-persistent.	D.M	- S
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C.A.P Non-persistent. Grey crystals. Recognised by effects. K.S.K. Persistent, two hours Reddish brown liquid. Smell of pear drops. Affects eyes. Persistent, 3 to 30 dour of sour fruit. As for K.S.K. Phosgene Non-persistent. Mortal Nortal. Smell of musty hay. Coughing, chaptes to bluis cease temporaril 24 hours. As for Phosgene Market Liquid vaporises. Smell of musty hay. As for Phosgene As for Phos	Less severe.	As for D.M. Less severe	D.M.	Non-persistent.		SE
Non-persistent, Mortal PHOSGENE	More severe.	As for D.M. More severe	Pinkish white solid, as for D.M.	Non-persistent.	D.C	Ž
B.B.C. Persistent, two hours Smell of pear drops. Affects eyes. Persistent, 3 to 30 Odour of sour fruit. As for K.S.K. Affects eyes. PHOSGENE Non-persistent. Mortal. Smell of pear drops. Affects eyes. Odour of sour fruit. As for K.S.K. Affects eyes. Smell of musty hay. Coughing, choral provision of the pearling diffication of the pearling difficati	s. No damage to eyes,	Stinging pain in eyes, flow of tears. No damag slight irritation to shave face.		Non-persistent.	C.A.P	SASES
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cease temporaril 24 hours. DIPHOSGENE Slightly persistent. Smell of musty hay. As for Phosgene	bluish-red. Cough may	breathing difficult. S changes to bluish-red. C			PHOSGENE	S
I ≚ rapidly	orarily, but recur up to	cease temporarily, but re 24 hours.			DIPHOSGENE	•
CHLORINE Non-persistent. Mor- smell of bleach. Vis- Violent coughing breathing difficult of the coughing difficult	ifficult. No recurrence		Smell of bleach. Vis-		CHLORINE	OK N
	nose and lungs. Tears	flow from eyes. Cou	Recognised by effects on eyes and lungs.			



RECOGNITION AND TREATMENT

ACTION TO BE TAKEN

FIRST AID

REMARKS Wear anti-gas eye shields in the open. Wear gas detec-

tors and anti-gas capes.

Liquid: Apply anti-gas oint-ment at once. Clothesment at once. Clothes— Large drops: Remove outer lothing. Small drops: No at tion

Vapour: Adjust respirator if available, and move out of area if possible.

As for Lewisite,

Liquid: Skin—Apply anti-gas ointment, No. 2, or bleach cream at once for 1 minute. Wash thoroughly in water. (lothes—Large drops: Re-type clothing at once. Small drops: No action. Adjust respirator and move out of area if possible area if possible.

Liquid: (1) Eye: Wash out eye with water for 10 minutes. Evacuate to nearest medical post. (2) Skin: Apply anti-gas ointment for 1 minute, and remove, or bleach cream for 1 minute, and remove or wash with soap and water. (3) Dry dressing: Do not prick. (4) Clothes: Remove for large drops.

Vapour: Eye and Lung: Evacuate to medi-cal post. Skin: Wash with soap and water. cal post. Change clothes.

As for nose and choking gases. Skin: As for Mustard Gas. Treat as for Lewisite.

Liquid: (1) Eye: Wash out with water for 10 minutes. Evacuate to medical post. (2) Skin: Immediately apply anti-gas ointment No. 2 until it vanishes or bleach cream for 1 minute, and remove or wash thoroughly with water. (3) Clothes: Large drops: Remove outer clothing. Small drops: No action.

Vapour: Eyes and Lungs: As for mustard oas. Skin: Wash with water.

All Nose Gases:

4 (2) Alcoholic stimulants may be given.
5 (3) Do not evacuate to medical post.
Cases recover in 2-3 hours.

Anti-gas ointment No. 1 is ineffective against Lewisite. Protectoin as for Mustard

All Nose Gases: Adjust respirator if available. This gives complete protection.

(1) Adjust respirator.

respirator symptoms tend to become worse. Keep respirator on, as nose gas may be followed by a choking gas.

adjusted.

Adjust respirator if available. This gives complete protection.

In all tear gases, symptoms will subside when respirator adjusted.

All Tear Gases:

- (1) Adjust respirator.
- (2) Do not evacuate to medical post unless liquid in eyes. Recovery in 1-2 hours.

All Choking Gases: Adjust respirator if available. This gives complete protection.

All Choking Gases:

- (1) If gas present, adjust respirator. If respirator lost, place damp cloth over nose and mouth.
- (2) When possible, remove from gas area.
- (3) Warmth; hot, sweet tea.
- (4) No alcohol or smoking.
- (5) Immediate evacuation of serious cases to nearest medical post.
- (6) No artificial respiration.

HOW TO PREPARE A GAS-PROOF DOORWAY

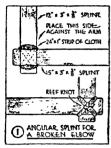
After

In the absence of respirators, it may be necessary to prepare a gasproof room, where you can retire in safety. The part of the blanket not nailed down should be held not natied down should be neight with detachable strip. Windows and ventilators should also be sealed down. Allow the blanket to rest on the floor to prevent admittance of gas.



FRACTURED BONES

The general symptoms of a fractured (or, in other words, broken) bone are indicated by pain and tenderness, swelling, loss of power in the limb, deformity, an unnatural movement or position of the limb or the bone may be felt just under the skin. All fractures should be splinted on the spot, care being taken to prevent further injury.



Fractured Elbow. This type of fracture requires great care and should be the responsibility of an experienced first-aider, but if none is available, serious complications may be saved if correctly applied.

A fractured elbow will swell at the joint. Use a 24 in. strip of cloth material at least 1 in. wide; bind a 15 x 3 in. and a 12 x 3 in. splint together at right

angles to form an L shape. The 12 in. upright should reach to the armpit and extend below the elbow, while the 15 in. horizontal should reach beyond the elbow and the finger tips. The splint can be placed on either the inside or outside of the arm, depending on which side is least injured. Pad the surfaces which make contact with the arm, especially over the bony parts. Then fix

Pad the surfaces which make contact with the arm, especially over the bony parts. Then fix the splint in position with three bandages. Place one round the upper arm, and two round the forearm, leaving the finger tips free. A large arm sling can then be put on to support the arm and a cold compress placed over the fractured part to reduce the swelling.

Fractured Upper Arm. First, support the forearm across the chest at right angles to the upper arm and apply a narrow sling. You can use either two or three splints, and they should extend just beyond the elbow joint and beyond the shoulder, and the splints should be padded, especially over the bony prominences.

In addition to the bandage round the forearm, another (or two) should be bound round the splints as shown, one section above the injury





Fractured Upper Arm

and the other below. A reef knot is used to tie the ends. If it is not possible to obtain a splint of any sort, tie the arm to the side of the body with two bandages.

Fractured Forearm. First of all, place the arm across the chest, and then make either one or two splints (folded newspaper will do if nothing else is available), and tie as shown. It can then be completed by the addition of a large arm sling.



FRACTURES

When tying the splint to the forearm, try and do so on either side of the fracture.

Until medical attention is obtained, great care should be exercised when fixing splints on to a fractured limb, and the splinting should if possible be carried out by an experienced first-aider.



Wrist. With a fractured wrist, a well padded splint, about 3 in. wide, should be applied to the forearm, so that it goes well under or overlaps the elbow at one end and the fingers at the other end.

The splint is then secured with two bandages, one to hold the splint to the upper part of the forearm, and the other forming a figure 8 around the hand. The ends are tied with reef knots. The arm should then be supported in a large sling, and a broad bandage fastened around the arm and the chest in order to minimise movement.





Fractured Collar Bone

Fractured Collarbone. This is generally indicated by the patient supporting the elbow with his hand, inclining his head towards the injured side. Take off the coat and as much of the clothing as possible, then place a pad in the armpit and secure firmly to the side, as shown above or on Page 29. See that the circulation of the arm is not interfered with by feeling the pulse; if it cannot be felt, relax the bandage round the body a little.





Fractured Ribs

The lower two illustrations show how to bandage the broken ribs and shoulder blade respectively. A break in the ribs can usually be told by sharp, cutting pain and difficulty in breathing easily. If the lungs are hurt, frothy, bright red blood will be coughed up. In this case, do not bandage, but lie patient down, with body turned towards the injured side, and support him in that position. Loosen clothing, and place the arm on the injured side in a sling and apply cold compress to seat of injury.









Fractured Forearm

Fractured Shoulder Blade

FIRST AID

FRACTURES

It is important that a fractured limb should be secured in splints before the injured person is lifted. In the absence of an experienced first-aider you may have to take matters in your own hands, hence these notes.

THE ACTUAL SETTING OF **FRACTURES** SHOULD BE LEFT IN THE HANDS OF THE DOCTOR, AS UNSKILLED HANDLING CAN DO MUCH HARM.

A simple fracture is one where the bone has a clear break; a compound one is where the broken bone protrudes through the skin edge or a wound leads down to the fracture.

A Fractured Foot. This injury is indicated by pain, loss of power, and swelling of foot. First, remove the boot and sock (perhaps by cutting away), and apply a well-padded splint to the sole



of the foot by means of two bandages as shown the accompanying sketch.

The first bandage Fractured Foot

The bird be taken around the ankle and the splint in the form of a figure 8, and then brought to the side of the foot, or the back of the splint, where the ends are tied

with a reef knot. The other bandage is taken two or three times around the toes and the splint before tying. The splint should be a little longer than the foot, and the foot should be raised slightly on a low pad or cushion.

A Broken Ankle. A splint is fixed to the sole of the foot in the same manner as described in the next column for a broken foot, and then supported by two splints, which should extend from below the foot to beyond the knee (in the same style as outlined above for a broken leg). This can be secured with four bandages, two around the lower leg, one around the ankle to hold the foot firm, and one above the knees.

A Fractured Kneecap. Indications are great pain, helplessness of the limb, irregularity, and s w e lling.



H Fractured Knee-cap

push a long splint under the limb to reach from beyond the heel to the buttock.

Allow the

lie face upwards, on a high pillow, and then

care fully

Place a good size pad in the natural hollow under the ankle, to raise the heel, as shown. Fasten the splint around the thigh and lower leg. Tie where shown, one being tied on the upper surface of the splint just under the bottom of the foot. A cold compress placed over the fracture will reduce swelling.

A Broken Leg. If both bones of the lower leg are fractured, there will be no doubt concerning the injury, but sometimes when only one bone is broken the deformity is not so noticeable. When the smaller bone has been broken, the patient may be able to stand fairly well, because the

FRACTURES

other bone serves as a splint and, if the break occurs near the ankle, it is easy to mis-

take it for a sprain.

There may also be considerable discoloration of the skin over the fracture.

If a third person is present have him steady the leg by holding the ankle and the noting the ankie and the foot, and then gently draw the foot into its natural position. The leg should not be allowed to slip into any other position while the splints are being applied.

If no actual splints are available, use a walking stick or some other stout piece of wood or iron, or, if nothing is available, both

and feet.

if handed treatment. legs could be tied together at the thighs, ankles,

Showing single-

3

Fractured Lea

around both legs as indicated.

b a ndaging can be done as shown on the left, or, if working single-handed, all bandages can be tied

If only

one splint is

a v a i lable,

If two splints can be used, they should be applied to the outer and inner sides of the leg, and extend from above the knee to beyond the foot. Tie the bandage first above the fracture and then one just below the fracture, one around the ankle, one over the knee, and then the others can be arranged to suit.

A Fractured Thigh. Indications of a fractured A Fractured Inign. Indications of a fractured thigh will be pain, loss of power, swelling, and discoloration, irregularity of the bone; the foot will lie on its outer side, the limb may be slightly shorter than the other limb, and the patient, when lying on the back, cannot raise the heel from the ground.

Have someone to steady the limb at the ankle. while you pass the seven bandages under the while you pass the seven bandages under the natural hollows of the limb and the body by means of the flat stick. Then carefully pull the bandages into positions indicated in the illustrations; apply a splint on the outside of the body and the leg to extend from the armpit to beyond the foot, and a second splint the full length of the leg on the inside surface.

As you tie the leg bandages, have an assistant gently draw the foot down to the same level as the other foot, and be most careful that the leg is not_allowed to slip back into its former The lowest bandage makes a figure 8 position.



Fractured Thigh Bone

around the foot and the splint, and the ends are tied with a reef knot under the foot. Two broad bandages should be fixed around the body or they could all be tied right around as indicated.

Do not attempt removal of the patient until splinting has been completed and some form of stretcher is available, and even then take particular care to prevent movement of the injured part.

FIRST AID

GENERAL HINTS

Shock. Indications: Shallow breathing, weak pulse, pale face and lips, beads of cold sweat, skin clammy, and falling temperature. Patient should be covered all round with rugs or coats and lie down; clothing should be loosened, and, if no internal injury, plenty of sweetened tea or coffee given to drink. No alcohol. Hot-water bags should be placed against sides of body and between loss. between leas.

Burns. Put out any burning clothes by smothering flames with rug or anything available. Remove or cut away any clothing from the injured part. or cut away any clothing from the injured part. Put a cover over any burnt skin to keep air out. Do not break blisters, but place burnt part in lukewarm water, to which a small amount of boracic acid, salt, or baking soda has been added. When dressing ready, bandage tightly. "Tannafax" is very good to cover the injured part with. Do not use butter or carron oil in the wound. Give plenty to drink.

Concussion. Indicated by pale face, cold skin, quick and weak pulse, shallow breathing, slightly dilated pupils, and patient in a stupor. Clothing should be loosened, patient laid down in darkened place and kept warm. Apply cold-water compress

Compression of Brain is indicated by flushed face and heavy breathing, and blood may ooze out from nose and ear. The pupil of one eye may also be larger than the other. Treatment: Same as for concussion; if ear bleeding, incline patient towards that side and apply soft dressing. No stimulants or smelling salts.

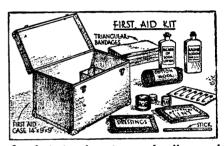
Dislocation or Sprains. Apply cold compress to dislocation or sprains, and keep it wet. A sprain can be bandaged, but not a dislocation or a strain. A strain should have a warm-water compress

Fainting. Sprinkle face with water, loosen clothing around neck and waist; put hot-water bottles over heart and stomach; rub legs and arms upwards, and give smelling salts. Lie patient down and raise feet.

A FIRST-AID KIT

A square-shaped one is best, as it will not easily fall over and will allow bottles to stand upright. You will require at least four triangular bandages (cut from a 40 in. square of calico), a few pieces of sterilised lint, gauze, or clean linen for dressings, a roll of cotton wool, three or four 1 in. to 3 in. rolls of bandage, a roll of I in plaster, two or more large handkerchiefs for tourniquets, a piece of stick to tighten same, bottles of antiseptic lotion, scissors, safety pins, enamel basins, clean paper, and a tin of boracic

One way of **sterilizing dressings** is to immerse in boiling water a selected tin to hold the dressings, and then allow to dry by evaporation. Line the tin with a piece of clean cloth, and place the strips of gauze or clean linen in the tin. Cover with the cloth, put on the lid, and bake in a fairly hot oven, but not so hot that the dressings will scorch. Leave the tin in oven for about an hour. On removal from the oven, seal down the lid with sticking plaster to prevent entry of air and germs. Dressings treated in this way will be quite free from germ infection.



See footnote of next page for Home-made Lotions for Kit.

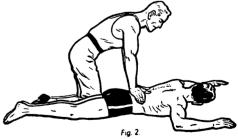
ARTIFICIAL RESPIRATION (The Schafer Method)

warmth.

Artificial respiration, or the restoring of natural breathing, is used in cases where breathing is enter to be failing or has ceased, examples of which are drowning, hanging, choking, inhalation of gases, electrocution, pressure on chest, smothering, etc.

Commence treatment immediately. Lay the patient in the prone position as shown, with the arms extended above the head. Turn the patient's head on one side, so as to keep the nose and mouth away from the ground, making sure that the air passages are clear by inserting a finger into the mouth and sweeping it deep into the throat to remove possible obstruction, such as weeds or false teeth, etc.

nearly touching, fingers circling the loins on either side, and pointing to ground, but not spread out. (Fig. 1.) Then swing body forward slowly, keeping arms straight, so that your weight is conveyed directly downwards. (Fig. 2.) This is conveyed directly downwards. (Fig. 2.) presses air and water in the lungs out through the mouth. Then swing your body slowly back-



wards to first position, removing the weight from the hands, which are kept in position. The releasing of the pressure induces air to pass back into the lungs.

Do these movements at the rate of:
Pressure, 2 seconds; relaxation, 3 seconds;
and so on. When natural breathing begins,
regulate movement to correspond with it,
and promote circulation by rubbing the limbs
vigorously towards the heart and by applying



First, kneel on one side facing his head. Take up the position shown, feel for the lowest ribs, and place the hands over them. wrists

INFECTIOUS DISEASES

We have been specially asked to include some of the most important of these diseases in this book, as it may prove very useful to so many. All these, with the exception of the last three diseases, should, of course, be notified to the Local Board of Health without delay. The incubation period is the time after an infectious contact until the illness begins.

Until a medical certificate is produced. Suspect 10 days. 7 days. 7 days. days. days. days. 3 days. days. 7 days. 3 days. ٦ consecutive negative swabs taken at intervals not less than 48 hours days. If previously suffered from Measles may return to school. 21 days. Not to be excluded if previously suffered from Chicken Pox. 24 days. Not to be excluded if previously suffered from Mumps. Not less than 12 days, and until 2 Until a medical certificate is pro-Until a medical certificate is pro-21 days. If previously suffered from Whooping Cough, may return to School apart have been obtained. Exclusion from Contact Not to be excluded. Periods of Isolation and 14 days. school. duced. 10 days. duced. 21 days. 10 days. Juced.

5 weeks from beginning of whooping stage and not less than 2 weeks after characteristic cough has Not less than 21 days after onset of Not less than 14 days after the At least 4 weeks from the appear-For not less than 2 weeks, and at least I clear week after the com-Not less than 3 weeks, and until 2 consecutive swabs taken at intervals not less than 48 hours apart have been obtained. Medical cer-Until a medical certificate is pro-Until a medical certificate is proplete subsidence of all swelling. lificate to be produced. appearance of the rash. Sufferer ance of the rash. 21 days. duced. days. days. Spreading inflammation usually of face. coughing ending in whoop or vomiting. Fever, itchy rash with Headache, fever, stiff sore Headache, fever, stiff watery eyes, rash beginning finely spotted rash, beginwatery tops begin-Fever, rash beginning violent Swelling under ears. Usual Symptoms Continuous fever. Sore throat, or nose, or croup, ning on body. ning on body. throat, cough, ð on body. on face. back. Spasms Fever, Sore days Incubation Period days days 2-10 days 1-10 days 1-10 days 5-21 days 4-25 days 2-20 days 7-14 days days 6-18 2-5 11-21 9 Whooping Cough German Measles Typhoid Fever Cerebro-Spinal Scarlet Fever Chicken Pox Disease (Scarlatina) Meningitis Diphtheria Erysipelas Paralysis Measles Infantile Mumps

USEFUL HOME-MADE LOTIONS

A bottle of bi-carbonate of soda lotion can be made by dissolving I teaspoonful of bi-carbonate of soda in ½ pint of boiling water. Use this strength for burns. For eye baths reduce this lotion with 4 parts of boiling water. Allow to cool before using.
A second bottle of solution can be prepared by dissolving ½ teaspoonful of salt in ½ pint of boiling water. This is called a Saline Solution. Use as a mild antisepic, a lotion for bathing and swabbing wounds, and as a gargle. Reduce with 2 parts of boiling water for eye baths.

SUGGESTIONS IN CONNECTION WITH FOOD RATIONING OR SHORTAGES

PREPARE FOR RATIONING OR SHORTAGES

There is always the possibility that the food position may become more acute than it is now, and it may be necessary to ration certain types of food, whilst others may not be available at all. It is therefore wise to pay some attention to this important matter.

this important matter.

One thing the League of Nations did well, and that was the study of the food requirements of mankind. This revealed under-nutrition on a big scale in most countries, even in those like Australia, where the general standard of living is highest. Up till the outbreak of this war much progress was made in educating the public in the constituents of common foodstuffs, and still greater progress has been made since.

Perhas our enemies forced to make the maximum of the constituents of the constituents

Perhaps our enemies, forced to make the maxi-Perhaps our enemies, forced to make the maximum use of limited supplies, have gained most, and in those countries they have contrived to do wonders on the principle that half a loaf is better than no bread, which principle has been applied to everything, down to refuse that might contain proteins, carbohydrates, fats, minerals, and vitamins which, to keep fit, the body must have in regular and right proportions.

So far we have not worried much about this as we have been able to pick and choose and the problem of food shortage has not entered our

minds so very much, or at least not until recent months.

Let us, therefore, consider the facts and some of the possibilities. The enemy is not so very far from our doors, and a few raids might easily dislocate our food distribution organisation. City people in particular might have to go short. Raids or no raids, there is a distinct possibility that a number of foods may be rationed, and what preparations can be made by individuals should be made.

be made.

For instance, fresh fruit and vegetables, in particular, and even meats, could be preserved, and the best should be made of all foods, whilst much benefit might accrue from the study of food values. Vitamins in particular foods, and various other aspects of the food situation will be shown in the following pages.

TRY MAKING YOUR OWN BREAD

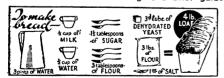
One of the first things the enemy will attempt if he can get within striking distance will be to smash away the channels of food distribution to and within the cities.

Home bread-making will suggest a step back

into the distant and primitive past. Just so, but

as in a recent strike, it may be very useful.

Dehydrated yeasts can be obtained. These facilitate the work. Following is a brief guide



for making bread in the home, using a 3d. tube of dehydrated yeast, and assuming that a 4-lb. loaf of white bread is the objective:

loaf of white bread is the objective:
Put 3 pints of water into a deep container, heat to about 80 degrees. If fresh milk is available, substitute half a cupful of milk for a similar quantity of water, and add 1½ tablespoonsful of sugar, 3 tablespoonsful flour, and sprinkle with the cube of yeast. Then stir well, and when quite dissolved add 3 lb. flour and 1 oz salt place a light cloth on the top of the salt. Place a light cloth on the top of the container or basin to prevent the formation of a crust on top of dough. Then stand in a warm place for 4 to 6 hours to allow the mixture to develop to twice its original size.

It should then be knocked down by plunging

the closed hand into the middle of the dough. You should watch this development carefully, and if the dough suddenly collapses in the centre there is no need to knock it back. The dough should be pulled from the sides over the depression made, so as to have a fresh top. Replace the cloth and leave for 2 hours. Then turn on to a table nicely dusted with flour, and knead Replace lightly.

Shape into loaves sufficient only to fill twothirds of greased and warm baking tims. New tims should be baked in the oven before using. tins should be paked in the oven before using. Place tins in a moderately warm spot till dough has filled them. This should take from one hour to 1½ hours, according to temperature. Test heat of oven by browning a pinch of flour on an oven tray for 20 seconds with the door closed. If electric oven is used, commence baking at 460 degrees, then cut off the top element, leaving the lower element to continue the work. With a gas stove the commencing heat should be about 400 degrees, and the heat reduced to 350 degrees when the bread is browned. If an ordinary oven is used, the process will be much the same as is used, the process will be much the same as with a gas oven. The idea is to place the bread in at the high temperature, and then gradually reduce the temperature. It takes about 60 minutes to bake a 4-lb loaf and 40 minutes for a 2-lb loaf. When baked, turn out on a wire tray to cool as quickly as possible, and to get a shiny finish immediately brush the loaf with water. with water.

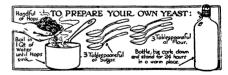
Dehydrated yeast can be used in various ways for making bran bread, wholemeal bread, cheese loaves, yeast buns, crumpets, and many of the

beverages.

HOW TO MAKE WHOLEMEAL BREAD Hints on Making Your Own Yeast

Although excellent bread can be made the home without yeast, most people prefer to use yeast. This can be obtained in compressed or dehydrated form, but you can also prepare your own stock. When making wholemeal bread it is essential to use rather more yeast than for white bread.

The following is a good, simple method for making wholemeal bread (or nearly wholemeal) with the help of compressed yeast:



This is the method:—Ingredients: 5 lb. wholemeal, 1 lb. plain flour, 2 oz. salt, 11 oz. compressed yeast. Dissolve the yeast and 1 oz. to 11 oz. sugar by pouring over yeast and sugar a little tepid water (just enough to cover), and stand in a warm place. When the yeast is thoroughly dissolved (stir if necessary) sift the flour and make a hole in the centre; pour in the yeast mixture then add the tepid water. the yeast mixture, then add the tepid water (potato water is best), in which salt has been dissolved. Mix well, knead lightly, put into tins —a little more than half full—and leave to rise until the contents fill the tins. Then prick the top to let the air out, and bake for an hour in moderate even which should be bet to the a moderate oven, which should be hot to start with, then let heat gradually diminish. The manufacturers of dehydrated yeasts and other yeasts also give instructions for wholemeal breadmaking.

You can prepare your own yeast, too, if necessary. There are various ways. Here is one way: Take a small handful of hops, add 1 quart of cold water, and boil till hops sink to the bottom (about 20 minutes); then strain and cool. Mean-

SUGGESTIONS IN CONNECTION WITH FOOD RATIONING OR SHORTAGES

while have available 3 tablespoonsful of sugar and 3 tablespoonsful of flour. Blend the flour and sugar with a little of the hops liquid, and star all well together. Then bottle, cork, tie down, and stand in warm place.

The yeast should be ready to use in 24 hours. When ready the cork will pop out as soon as untied. A pint of this yeast should be equal to about 3 oz. of solid yeast. Or a successful variation of this method could be: One handful of hops, 1 pint of boiling water, 4 tablespoonsful of sugar, 4 tablespoonsful of flour; pour boiling water over hops, allow to stand till lukewarm, then strain, add flour and sugar to liquid; mix well and bottle. If you can add a little yeast from an earlier preparation, so much the better.

VALUE OF WHOLEMEAL BREAD

In Britain, wholemeal bread is recommended as the principal item of a model daily diet for a man engaged in physical work. For children suffering from malnutrition, wholemeal sandwiches are provided by the authorities in some parts to supplement home foods. Wholemeal bread provides the foundation of nearly all the various utility meals.

It is said that many dietaries are low in iron, and the use of whole wheat bread may easily increase the day's total iron 30 to 40 per cent, and it is estimated that the body will absorb about twice as much phosphorus, iron, and cal-



cium from 1 lb. of wholemeal bread as from 1 lb. of white, to say nothing of the vitamins.

It is, however, but fair to acknowledge that millers of later years have been re-fortifying flour (white) with much of the food elements that had formerly been lost by fine milling. Nevertheless, wholemeal bread is the best, and you can make your own.

To be sure, you can start with the wheat. Put the grain through a coffee grinder, mincer, or sausage machine. Having thus obtained the basis, it might be wise to add a little white flour for your first experiment, and later use less of he white flour. Take as ingredients \(\frac{1}{2}\) lb. whole or wheaten meal (plain), \(\frac{1}{2}\) lb. flour (plain), \(\frac{1}{2}\) lb. whole or wheaten meal (plain), \(\frac{1}{2}\) lb. flour (plain), \(\frac{1}{2}\) latespoon of soda (bi-carb., lumps flattened out), \(\frac{2}{2}\) teaspoons (level) of cream of tartar, and sufficient milk to make a soft dough. Mix the meal and flour together, add salt, cream of tartar, and soda; then mix all thoroughly; add enough milk or milk and water to make a soft dough; then knead lightly—very light kneading is sufficient (do not knead as you would yeast bread). Then cut in quarters, put on a floured tin, and bake in a good oven for 30 to 45 minutes. Buttermilk may be used unstead of cream of tartar.

Because of the small quantity of white flour used, this may not be a wholemeal bread in the strict sense, but it will be a brown bread very lose to wholemeal. Many people order brown bread in the belief that they are getting wholemeal, but that is not so.

HOW TO PICKLE MEAT

There may at some time or other be a scarcity of fresh beef in Australia. Moreover, all the beef that can be spared may be required for the Forces. Do not overlook the possibility, also, of increasing transport difficulties, even very serious dislocation of facilities.

Therefore make the best use you can of beef while you can get it. It would be a good idea to pickle some. This is a fairly simple pickling process:

In the first place all that is wanted is a small wooden tub or cement vat. Be careful to use good water. If water is drawn from some of the reservoirs, rivers, or dams it would be wise to boil it before using it. Add salt to the water, and stir well. The liquid should be sufficiently salty to float a potato easily or a sound egg—potato for preference. Continue to stir, and add ½ lb. of saltpetre to every 10 gallons of the liquid. This will give a colour to the meat.

Where the meat is thick, such as topside, silver-side, chuck, blade, or ribs, incisions about 3 in. apart should be made in the meat. Bones should be removed. If pickling or salting is done on a farm, the meat should be allowed to set after killing. Purchased meat is always well set. The meat should be placed under a small wooden rack made to fit in the tub or vat, and a weight should be put on the rack to ensure that the meat is well immersed in the brine. Care should be taken to prevent exposure of any portion of meat to the air. This is particularly essential in hot weather.

There should be more mutton available than beef in all probability. There is no need to remove the bone from mutton for salting, but in the case of the leg it might be cut open so that the brine can penetrate well into the flesh. The shoulder should be removed, so that there, again, the pickle can go well into the meat. It is well to open the joint in the shoulder. Should the loin or forequarter be salted, it would be well to chop through the joint, so that it can be thoroughly salted.

In properly salted water, the meat should be pickled in two or three weeks. If left in the water after that it may become too salty, and



must be well soaked in fresh water to remove the excess salt. If the meat is to be kept after it has been pickled it can be dry salted.

For the dry salting process you need to remove all the bone from beef, as in case of wet salting, and slice as advised. Then rub salt in, and leave loose salt lying over the beef. Mutton should be cut up as for the wet process, and should be rubbed well with dry salt, leaving the meat more or less covered with a small layer of salt.

This treatment can be used in any part of Australia, regardless of climatic conditions.

SUGGESTIONS IN CONNECTION WITH

FOOD RATIONING OR SHORTAGES

SOME OTHER MEAT "TIPS"

Years ago, before cold storage and other modern facilities brought amenities to domestic activities, it was quite a common thing to treat meats, not only with a view to preservation, but also to make them more tasty when fresh.

Home-treated spiced meat was much in favour in the colonial days. The meat, say, beef, was hammered out lightly with a wooden mallet. Fat was cut away. It was then placed for a few minutes in vinegar, or vinegar with a little sugar-added.

Afterwards the meat was set out on a board with a very smooth surface. Then all over it was sprinkled a mixture containing vinegar, sugar, cloves, cinnamon, salt, pepper, and mustard, made up according to individual ideas. There was no hard-and-fast rule as to the quantities of constituents making up the mixture. The meat would then be left for some time until nearly dry. Next process would be the sprinkling of dry spices all over it. The spices would set well on the meat not quite dry.

The meat would then be rolled and tied up to look like a roly-poly pudding. It was tightly rolled. Then the roll was placed on its side, and pressed between pieces of clean, smooth wood.

Weights about 50 lb. to 60 lb. or more were left on the top slab, and left for a day. The roll was then untied, and the whole process repeated



the next day, and again the next. The meat changed to a dark colour. It was then boiled. Some people allowed boiling for no more than three minutes. The meat was then put aside in a cool place, to be used as required. It could be eaten without more treatment, or could be cooked again, and made into various tasty dishes.

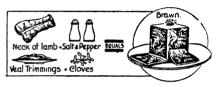
Boiled meats were often preserved in fat in jars. After cooking—boiling—the meat was loosely packed in jars or bottles, and covered with boiling mutton fat. Clarified fat was used. The fat was clarified by bringing to boiling point, and then adding cold water; the impurities then sinking below the pure fat could be drained off. When the container had been filled with the meat and the boiling fat, a covering, often thick paper, was placed on top, and stuck with paste about ½ in. to ½ in. along the side. This sounds like a rough and ready method, but it served, and the meat came out nicely when wanted in the shape of the container.

Householders also in the old days frequently processed their own bacon and ham. When pigs were scarce, as they were from time to time, mutton was used for making "ham," and the "colonials" had ways of drying meats and rendering it down into granulated or powder form. Many useful culinary "tips" may be gleaned from the everyday practices of our pioneers.

BRAWN CAN BE CHEAPLY MADE

People are ready enough to complain of the price of fresh meat in the shops. The prices of popular cuts do always appear to be high, even when sheep, cattle, and pigs may be selling cheaply in the stock markets. But have you thought of the prices the retailer has to accept as a rule for the unpopular cuts? Then there are parts of the carcases that sometimes have to be almost given away. The neglected parts, because they have to be sold at relatively low rates, often cause what appear unduly high prices for the parcels in most demand. Yet the lower priced lots are not necessarily inferior; they may be the best buying.

What could be better, for instance, than lamb or two-tooth mutton neck scrags and oddments of veal for making savoury, wholesome brawn? You try. Set out to prepare a brawn with 2 lb. to 3lb. of lamb or young mutton scrap and about



½ lb. to 1 lb. of veal trimmings. Chop the scrags down into neat pieces not too small. Then rub dry salt well into the pieces, and place them in a muslin bag. Put the bag into a pot or boiler. Next cut the veal trimmings into cubes, sprinkle with 2 oz. salt with a fair quantity of pepper added, and place also in the pot. Cover the contents with clean, cold water. Add a few cloves, and, if available, two or three veal bones. Then bring the whole to the boil, and allow to simmer for two hours. At end of cooking, remove the veal bones, strain the veal through a colander, and drain the lamb or other meat on a dish. The lamb meat should then be cut into cubes and mixed well with the veal. The mixture is then put into a basin or basins, adding a little of the liquor from the cooking. Cover the tops of basins with cellophane, and stand in a cold place to set. If you are fortunate enough to have access to a refrigerator, put the brawn in, and it will soon be very well set.

Or try pig's meat and beef. The main ingredients of Oxford brawn are usually surplus pork bellies and pigs' head meat, with a little good, lean beef added. The pig meat is put into a strong brine, and left in brine for about 12 hours, then into a muslin bag. The beef is chopped and put into a mincer, then in a separate bag. Both bags are placed in a pot. Cold water is added. The water is brought to the boil, and is left boiling for about four hours. Next, the pig meat is cut into small cubes, placed in the bag containing the beef, and allowed to simmer for an hour or so more. The contents of bag should then be emptied on to a dish, and later placed into well-greased basins. A little of the cooking liquor should the added to each basin. The meats should then be well mixed, but be careful to avoid breaking up too much. The brawn would then be placed inside a cold spot to set.

You could also make a pig meat brawn. Leave beef out altogether if thought advisable. It experiment as suggested is satisfactory you can go on with larger quantities.

SUGGESTIONS IN CONNECTION WITH

FOOD RATIONING OR SHORTAGES

THE VALUE OF DRIPPING

It is important that a stock of fats be laid ande by every householder for use in days of trisis

Dripping is a most valuable source—it was the principal fat food of our grandfathers. Dripping keeps well, and it is cheap to buy. And it list the passily from fats in the homes—fats that as often as not are thrown away. Save all those pieces of fat left in the plates, on bones, or cut away possibly from meats before cooking. They make dripping.

Beef dripping is better than mutton, but an excellent article is a mixture of the two. Home-made dripping is better as a rule than the lought, for the reason that the bought may be rather more refined, and thus lack some of the ingredients from meats that figure usually m home-made dripping. On the other hand, hought dripping has better keeping qualities than



ordinary home-prepared. Yet the keeping qualities of home-made dripping can be improved by refining the material. This is done by adding a little water to the fat and boiling. Substance in the more liquid form, which will contain impurities, can then be drained off. You should then have dripping that will keep well.

Get back to dripping, medical men in Britain are advising now. "Dripping possesses virtues about which very few folk these days know anything at all," wrote one of these medical men recently. "Rich fats are thrown away because their virtues are not appreciated. . . Dripping is still of vitamins as a young carrot. . . Bread and dripping and, or, better still, bread fried in dripping, is pedigree stuff. Dripping is the land."

DO NOT DESPISE LIVER

Dietitians say that the internal organs of animals are the richest of meats, i.e., in protein; they are body-building or flesh-forming foods in concentrated form.

So, if you are among those who are inclined to turn away from liver, heart, or the like, read up about these things, and you will soon become



convinced of their food values. Some people, again, who cannot take to liver, for example, in the customary way, might find it palatable an ingredient of potted meat. Try a liver and beef loaf. Make a small loaf as an experiment.

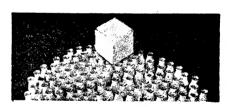
Take about ½ lb. of good liver, next soak ½ lb. of fine rusks. Turn the rusks on to a dish. Then mince the liver and sprinkle the rusks over the liver. Add ½ oz. of salt and 1 oz. of ground mixed herbs. Mix well together with a wooden ladle. Then cut about 1 lb. of lean beef into 4-in. cubes, and pass through the mincer. The

beef should then be added to the liver and rusk mixture, and all should be well turned over and over with the ladle, mixing well together. Next place the mixture in a muslin bag. Tie the end of the bag, and put into a pot; bring to the boil, and let simmer for an hour. Then remove the bag from the pot, and let it drain well. The contents would then be ready to place in basin or mould, and should be pressed down firmly by using a piece of clean board. The result should be a tasty liver or liver and beef loaf, which can, if necessary, be nicely glazed. A glazing liquid can be prepared by using 1 part of gelatine to two parts of boiling water. The loaf should be placed in a cold place to set.

Doctors often advise the use of internal organ meat, such as liver meat, in the raw or nearly raw state. One way to follow this advice is by using fine particles of liver in the meat paste for sandwiches. The main ingredients of the paste could be a few cooked sausages. Remove the casings. Add a quantity of pickles or other relishes; then put in the liver particles, but not enough to give a liver taste. Mix up well, and pass the lot through a mincer. Then put into a jar, cover with melted butter, and seal. You will then have an excellent sandwich paste, containing valuable liver properties. The value of liver and other internal organs as items of diet cannot be overstated.

KEEPING MILK HANDY, "JUST IN CASE"

This is food par excellence, and the highest authorities place milk from healthy, well-fed cows on a pedestal as the best all-round food the world has to offer. Dr. Ramus, of U.S.A. Public Health Service, says: "We have in milk an ideal article of food," and Dr. Orr, Director of the Rowett Institute: "Milk has properties



which are found in no other foodstuff." These properties include calcium and phosphorus, and milk contains all the known vitamins.

Consequently you should—especially if you have children in your care—see to it that you have a little store of milk handy, "just in case." This means that you should put by a few packages of preserved milk. Preserved milk is available in several forms. It is not suggested that any kind of the preserved milks is quite equal to the best in the liquid state. Some are only skimmed milk preserved; but all are good, and whole milk which can be obtained in powder form retains nearly all the properties of fresh, full cream milk.

It is hoped also that pressed milk blocks will be made available soon. The sooner the better. These represent whole cream milk powders, which under treatment and nigh pressure is reduced to a solid mass. A most promising future is expected for the milk blocks. They are the result of intense research work conducted by the C.S.I.R., in cooperation with the dairying industry. A consignment of milk blocks from Australia has reached Britain, and has aroused great interest.

Army Light Bomber



SUGGESTIONS IN CONNECTION WITH FOOD RATIONING SHORTAGES

DRY YOUR OWN VEGETABLES

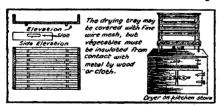
Drying of foodstuffs is well worth the attention of people whose thoughts are on air raids and evacuation problems. For one thing, water is bulky, and needless bulk would be a serious handicap should conditions necessitate quick move-ment from one place to another. Most vegetables can be dried effectively.

Carrots, parsnips, beans, and peas are among the most nutritive of vegetables. These can all be dried to advantage in the oven or by the sun, and the process is simple. Young, fresh vegetables are the best for drying.

It is advised that the preparation for drying be the same as when preparing for immediate use. The raw material should then be blanched by The raw material should then be blanched by immersing in boiling water for three to five minutes. The next operation is a plunge into cold water for about half a minute. Then by shaking the vegetables in a dry towel the surface water can be removed, and following that they should be spread on trays or on oven shelves. For sun-drying, trays of wood are suitable. If the trays are of wire, they should be covered by cheesecloth or something similar.

If oven drying is preferred, the vegetables should be left in the oven at 110 degrees to 115 degrees Fahr. for about two hours, when they will partly dry. Then the oven should be allowed to get hotter to 145 degrees to 155 degrees Fahr. Oven door should be kept open to allow damp six to expense. damp air to escape.

The vegetables should be moved about occasionally to ensure even drying, and when thoroughly dry they should be taken out and left in a container—a box will do—over night.



Should there be any sign of dampness next mornring, they should be returned to the oven. When taken from oven they will be brittle, but will soon become pliable again.

Sun-drying is slower, but the state of the vegetables can be watched just as well, and it is advised that sun-dried vegetables should be given final treatment in the oven for just a little while, at a temperature of about 170 degrees Fahr., so that any insect eggs that may be on them are destroyed. The dried material should be stored away in insect-proof containers, such as screw-top jars or tins with tight-fitting lids.

It is advised also that half a teaspoonful of carbonate of soda to the gallon of blanching water will improve the colour of beans and peas.

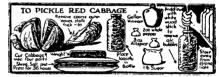
PICKLED VEGETABLES PROVIDE FOOD STOCKS

Pickles, sauces', chufneys, and ketchups scarcely come under the list of essential foodstuffs, but they have food values.

Pickled cabbage, for example, although not to be compared with fresh cabbage, is useful to have be compared with fresh cabbage, is useful to have in reserve, and if you would put some cabbage by in pickle, here is a way of doing it: Red cabbage is preferred. Select a firm head, remove outer coarse leaves, and cut cabbage into four pieces, but be careful to reject the centre stalk and heavy ribs in the leaves. Shred finely, and sprinkle well with salt every alternate layer of shredded cabbage, then press with a board or plate, and allow to stand for 24 to 36 hours. The salt will have drawn off the water from the cabbage, which should then be drained, and the cabbage will be ready to place loosely in the pickle bottle. The cabbage will be a purplebluish colour when first put in, but will turn to reddish when vinegar is added. A suitable vinegar mixture would be 1 gallon of vinegar, 2 oz. whole pepper, 3 oz. allspice, and 1 lb. sugar.

Scald the vinegar, sugar, and spices, then

Scald the vinegar, sugar, and spices, then allow to cool; strain, pour over the cabbage, and paddle with a narrow strip of white wood. The bottle should not be overfilled with cabbage, so that the stick can be worked around the contents quickly to displace any air bubbles and send them to the surface. Bottles should then be filled right to the top with the vinegar. They should then be sealed and stored away from a should then be sealed and stored away from a strong light.



Onions make a favourite pickle. These should be put in brine (say, 4 oz. salt to 1 pint water) for several days before pickling in vinegar. After brining, they are improved by scalding in weak salt water for about five minutes.

These are just two of many recommendations. For marrow-apple-onion chutney, for instance, take 2 lb. marrow, 1 lb. green apples, and ½ lb. onions. The marrow should be peeled and placed in layers in a basin, with salt between each layer, left for 12 hours, and then drained well. The apples and onions should be chopped finely. You need, in addition 12 pints vinegar, to which could be and onions should be chopped finely. You need, in addition, 1½ pints vinegar, to which could be added ½ lb. sugar, about ½ oz. each of chillies, pepper corns, and bruised whole ginger (if available) help in the flavouring. Put spices in a small muslin bag. All the ingredients should then be cooked (taking out the bag of spices later). Cooking should be continued until the contents are tender, and of a good consistency, when they should be ready for bottling.

Vinegar is the main pickling agent, and, having the vinegar and vegetables, the chances are you will be pleased with any pickling experiment you may undertake.

may undertake.

Army Light Bomber



SUGGESTIONS IN CONNECTION WITH FOOD RATIONING OR SHORTAGES

THE MANY USES OF VINEGAR

Vinegar is useful in so many ways that it deserves a place well up in the list of provisions you should set aside to tide you over troublous times. Vinegar imparts "edge," a keenness; it is you should set distributed by the set of times. Vinegar imparts "edge," a keeming, an appetiser, it preserves, and it cleanses. Vinegar olso soothes. Many an aching head has been soothes. Many an aching head has been soothes. Taken with honey and applied or with oil, it hastens colds away, and, applied externally, it is good to help reduce excessive bodily temperature.

And vinegar is cheap. If for no other purpose, it would be well to get in a supply for pickling.

Practically every vegetable can be put away in vinegar to advantage. Start, say, with carrots. Choose bright young carrots. Put them in boiling vinegar to advantage. Start, say, with carrots. Choose bright young carrots. Put them in boiling all water. And cook gently till three-parts done; then remove them and dip in cold water, slip the kins by gently rubbing, and be careful to keep the carrots nice and smooth. Then cut them into even slices, pack tightly in jars, and pour over them a spiced vinegar. The spiced vinegar might



be made up of 1 quart of vinegar, 1½ lb. sugar, ½ oz. cloves, 1 tablespoon of cinnamon, 1 teaspoon mace, and 1 teaspoon of allspice. Scald the liquid, strain over the carrots, put away, and you will have something nutritious and tasty when you want it. Malt vinegar is most generally used, but there are others.

THE VALUE OF TOMATOES: EITHER AS PRESERVES OR JUICE

In America a large proportion of the tomato crop is preserved in the form of juice, which is a popular beverage.

If you favour preserving as juice, select well-ripened tomatoes. They should be placed in a boiler or pan containing a little water, about I in deep. Cover, bring to boiling point, and let simmer until tomatoes are soft. Then pass through a sieve, the finer the better. Seeds and through a sieve, the finer the better. Seeds and skins will be left, and the pulp should then be passed through cheesecloths, thus separating the pulp and the juice. A little salt is usually added to the juice, which should then go into bottles, filling to about 1½ in. from tops to allow for expansion. Cork, tie down, and sterilize in a vessel holding cold water up to the shoulders of the bottles. Then heat to a temperature of 160 degrees Fahr., and maintain heat for 35 minutes. The bottles should then be placed on a damp cloth to cool. 4 damp cloth to cool.

The firmest, that is the least watery of the ope tomatoes, are best for pulping. These should be crushed slightly so as to extract a little of the then boil for about 15 minutes. If pulp is too thin, let evaporation go on by boiling longer. The tomatoes may be peeled, and the pulp may be strained before bottling, although, according to the experts, this is not essential. If, however, the pulp is strained, it should be brought to boiling point again before bottling. Salf, sugar, or ing point again before bottling. Salt, sugar, or even butter could be added if desired.

even butter could be added it desired.

Tomatoes may also be bottled whole or in slices. For bottling they should be firm and smooth-skinned. It is not necessary to peel. They should be cooked for about 15 minutes at boiling heat. The end of the process is the filling of bottles with boiling liquor and sealing. Green tomatoes, after being soaked in brine for two or three days preserve well in vinear. or three days, preserve well in vinegar.



Of course, the tomato is at its best when ripe and fresh. It is rich in vitamin C, well supplied with A, and provides fair quantities of B1. It is said to embody 15 minerals and three acids. The organic acids of the tomato stimulate the appetite and encourage the flow of digestive juices. The tomato is especialy valuable as a blood maker and purifier blood maker and purifier.

PRESERVE A FEW DOZEN EGGS

Eggs are positively essential to our well-being as a source of high-grade foodstuffs.

as a source or nign-grade roodstuffs.

A standard 2-oz. egg is made up of about 58 per cent. white, 32 per cent. yolk, and 10 per cent. shell. The pulp, that is the white and the yolk, contains 74 per cent. water, 14 per cent. protein, 11 per cent. fat, and about 1 per cent. cent. minerals.

There are several ways of preserving eggs. Various preservatives are on the market. When putting eggs down in liquid you should be careful to obtain naturally clean eggs. Washing harms the



shell surface. If you prefer to preserve eggs by a waxing process, you still need naturally clean, unwashed eggs.

unwashed eggs.

Egg in powder form is almost, if not quite, as valuable a foodstuff as in the fresh state in the shell. It certainly compares well with egg in any other preserved form.

Egg dehydration is in operation in a big way in Australia now. One pound of powder represents on the average 3½ dozen standard 2-oz. eggs. The 75 per cent. moisture content is reduced to 5 per cent. in the dehydration process that is in operation for supplying powder to the that is in operation for supplying powder to the Federal Government.

DRIED FRUITS HAVE VITAL FOOD

In war time dried vine fruits are of special In war time dried vine fruits are or special value. Sultanas, raisins, and currants are the principal crop. They need occupy very little store space. Their keeping qualities, on top of their fuel content, bring them into No. 1 category of wholesome foods for use in time of emergency. They really deserve a place in the daily diet, and

especially during periods of distress, when vitality is being drained away, these fruits might appear in the diet regularly with advantage. These fruits are unsurpassed for the restoration of physical and mental vigour. They generate energy and prevent muscle exhaustion; they are rich in sugar; not, however, sugar in the form that is injurious to teeth. Rich also in iron, they fortify blood, replenishing the red colouring matter, which



carries oxygen to the cells; resists invasion of predatory germs. The energising food value of 1 lb. of sultanas or raisins equals 20 eggs, 3 pints of milk, 6 lb. of fresh apples, 4 lb. bananas, 4½ lb. potatoes, or 1½ lb. beef.

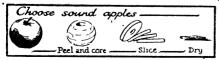
Moreover, dried fruits can be used in the preparation of most dishes. The more we come

to appreciate them, the more we shall benefit.

HOW TO DRY APPLES

Dried apples are quite tasty, and they are good food, containing fair quantities of vitamin C and some vitamins A and B. They are very easily dried. All that is required is good, sound fruit, preferably of the cooking varieties.

The fruit should be peeled, de-cored, and cut into slices or rings. The slices or rings when dried are wafer-like. A mixture of salt and water, dried are water-like. A mixture of sait and water, about two tablespoonsful of salt to the gallon, should be handy, in which to dip the apple slices for a few minutes. Then they are spread out on trays to dry in the sun. Sun drying takes about three moderately sunny days. Or they can be oven dried. The slices will be "soft and velvety



to the touch" when properly dried. They will also be pliable. A handful of properly dried slices will, after pressure in the hand, be springy enough to separate. If they stick together they are not well dried. Dried apples keep well.

HONEY PROVIDES A GOO GOOD SUBSTITUTE FOR

It is possible that sugar may be in limited supply at any time owing to transport problems,

Honey provides sugar in the best form. This is one of the few foods which comes to us in the natural state, and it is of special value to older people whose hearts are not quite as strong as before. A glass of warm water with honey



and lemon juice at night is often recommended and lemon juice at night is often recommended by doctors. Try honey with coffee in place of sugar. Honey is rich and easily digested, and contains energy-producing fruit sugar, iron, and other materials. It is good for asthma, for acidosis, and for colds. A small supply should be set aside by every householder. It keeps well, and would be a most valuable item to have available in times of emergency. times of emergency.

HIGH FOOD VALUE OF BANANAS

It is not so long since bananas were a costly delicacy, and it is only recently that their wonderful food value has been recognised. Iron, manganese, and copper, required for the red corupscles, and calcium, lime, and phosphorus, for teeth and bones, are embodied in this fruit.

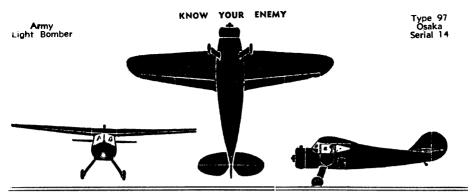
Several other minerals are there also.

About 20 per cent. of a ripe banana (excluding the skin) consists of glucose, ready for assimilation and turning into bodily energy and



warmth. Because of its value, powdered banana is imported into England, and considerable stocks have been stored there, retain their value. Dried bananas also

To Dry Bananas. Cut the fruit in slices about in. thick, and place on a cloth in a cool oven of about 110 degrees. The oven door should be of about 110 degrees. The oven door snould be left partly open to create a hot air current, which will dehydrate the fruit. Bananas take from three to four hours to dry. When ready, they should be placed in a box or tins, which need not be airtight, and stored away. When wanted for use the dried slices should be placed in a small amount of water, and allowed to soak for a few minutes. soak for a few minutes.



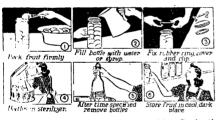
HOME BOTTLING OF FRUIT

Home bottling of fruit is well worth while just ow. Almost any fruit can be preserved, and the modern methods are quite simple. If no appecial outfit is available, the necessary equipment for doing the work can be gathered together from ordinary kitchen utensils.

The art of bottling is the art of sterilising spores and organisms in food and of sealing the tood while it is sterile, so as to prevent the entrance of fresh spores, etc., from the air. These organisms and spores are destroyed by heat in the process, and if the jars used are free from flaw, the tops fit exactly to prevent the passage of a single bubble of air, success should he easy. Any convenient vessel, such as a copper or kerosene tin, may be used to sterilise the jars

As for syrup, to each pint of water allow 1 σz , to 6 σz , of sugar, and boil together for 10 minutes. Then the syrup should be allowed 10 minutes. to cool. A clear syrup may be obtained by straining through layers of muslin. Or water without ugar may be used.

In the space of this article it is not possible to give more than a skeleton outline of an upto date method when using a well-known bottle



outfit. Briefly the procedure is this: Pack the fout into bottles, fill bottles with water or syrup, then cover and spring the clip. Filled bottles then placed in steriliser, water is put in sterili-er till about three parts of the bottles are columnaged. Steriliser is then heated, according to the instructions given for treatment of various to the instructions given for freatment of various funts. After temperature has been maintained to specified time bottles are lifted out and placed on a shelf or table to cool. Next day, when bottles are cold, clips are removed, the tertilising process having hermetically sealed the covers. The bottles are then stored away.

You will preserve valuable health-giving mineral compounds by bottling fruits.

compounds by bottling fruits.

THE ORANGE -- KING OF FRUITS

How many thoroughly appreciate the health-niving qualities of the orange. One independent tood specialist states: "It is well supplied with four vitamins and three acids. It also contains supplied to the property of the p vatious chemicals, calcium, phosphorus, potash, soula, sulphur, magnesium, iron, and iodine—all adultion and necessary to health. The acids are coally alkalis in disguise. Taken altogether as a

fruit or drink, the orange is a wonderful storehouse good things.

England, owing to restricted imports of oranges, has to resort to other special substitutes, whilst orange tablets and citrus juice are now being sent to our fighting forces and to others in place of oranges.

Cut oranges in half and extract juice (a glass comb is suitable for extraction). Strain juice.



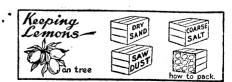
is not necessary to sweeten, but if preferred, add sugar up to about three-quarters the weight of juice. Pour juice into clean bottles or jars, cork firmly, and place on a wooden rack made to a size to fit into a sterilising vat. Put sufficient water in vat to reach shoulders of bottles or to about 1½ in. of the top of the jars; bring water to 160 to 180 deg. Fahr. and maintain heat for 35 mins. Then remove containers and stand on a damp cloth till cold—stand away from draughts of cold air. Opaque jars or bottles not necessary to sweeten, but if preferred, from draughts of cold air. Opaque jars or bottles are advised as containers.

FOUR WAYS OF KEEPING LEMONS

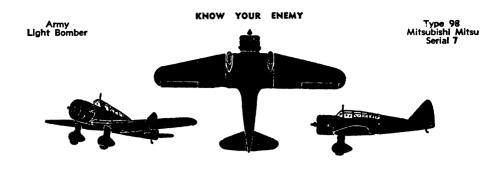
Never be without a lemon or two-they can be put to all manner of uses, and are valuable in time of illness. They have good keeping qualities and it is quite easy to put some away.

One good way is to pack them away in dry sand. There should be a thin layer of sand separating each fruit. They keep well in saw dust, too, or in tissue paper, or they may be stored on a shelf in a dark room having a cool temperature. In Africa, some preserve them in coarse salt, which is also used to keep oranges and green tomatoes.

Lemon juice is health restoring foodstuff for influenza and fever patients—it can also be used in many ways instead of vinegar. A little lemon



sprinkled on bananas will prevent them from going brown and it will act in the same way on apples and pears—a dash on asparagus, parsnips and cauliflowers will keep them white. Apart from these uses, it has other uses. It is soothing to the skin, it is an excellent cleanser and will remove stains from brass and various other solid things.



MAKING THE MOST OF WAR-TIME FOODS

Following on the preceding section, showing the

Following on the preceding section, showing the value of various foods and their vitamin value, the following illustrations make an interesting study. As a recent copy of "Pix" stated, it is a wise procedure to break up the household's food money into groups of guineas in order to ensure a well-balanced diet.

The odd shilling should be used for kitchen needs, i.e., salt, pepper, tea, and the like. The balance of 20/- should then be split into groups of 4/- each—4/- should be spent on fish or meat, 4/- on bread and dessert foods, 4/- on fruit and vegetables, and the balance in butter, eggs, milk, and cheese. Cheaper cuts in meat often give better value, and beef dripping has a higher value than butter, and so on; but there is not space here to include them all.

SUBSTITUTE FOODS

Potatoes, which are rich in vitamin C, can be replaced by swede turnips, and, unlike potatoes, they do not deteriorate with storage. Cabbage silver beet, spinach, and lettuce are all good sources of vitamin C.

If the housewife cannot buy potatoes for the main meat meal, if she serves a good helping of the above, the same nourishing value should

be obtained.

Citrus Fruits. Tomatoes (and especially raw tomatoes) should be eaten as often as possible, especially when no citrus fruits are available. Oranges are also a good substitute for potatoes.

Rice. Barley is a good substitute thickening for soups, etc., and macaroni custard instead of rice.

KNOW THE VITAMINS

VITAMIN

WHAT THEY DO

LACK MAY REMEMBER THAT



Prevents entrance of disease-producing organisms into the body. Keeps enamel of teeth in good in good condition. Promotes growth.
Promotes normal vision.

Night blindness. Retarded growth. Lack of vigour. Poor resistance to infection.

Ordinary cooking processes are not generally harmful. Rancidity in fats destroys vitamin A.

Some drying pro-cesses may result in a loss.



Promotes growth. Stimulates appetite. Aids digestion. Essential for normal condition and functioning o f nerve tissue

Beri-beri. Lack of appetite. Nervousness. Fear, low morale. Weakness and fatigue. Painful nerves.

Heat of ordinary cooking does not destroy B.

It is soluble in water and may be lost if cooking water thrown away Addition of sode to cooking water increases destruction.



Improves general tone of body. Aids growth. Prolongs active life span.

scaly condition of skin around corners of mouth, at base of nose, and on ears. Digestive disturbances.

uble in water, so may be dissolved out in cooking water. Exposure to air and heat have little effect.

Riboflavin is sol-

WHAT THEY DO

LACK MAY RESULT IN

REMEMBER THAT

VITAMIN

growth Promotes and good health. Maintains normal function of diuestive tract. Keeps skin in good condition.

Some skin troubles. Soreness mouth. Nervous disturbances Indigestion. Constipation.

Cooking and canning have little effect on the content of niacin.



Maintains cells of body in healthy condition. Keeps teeth

healthy. Helps wounds and nores to heal.

tections.

Scurvy. Anemia. Poor resistance to infection. Weakness and restlessness. muddy Sallow, complexion. Irritability. Weakened blood capillaries.

Exposure to air, drying, long cooking and addition of soda in cooking destroy vitamin C. Cook rapidly in boiling water, using cooking water when poscooking sible.

Use fruits and vegetables raw.



Essential to normal bone growth and tooth development.

Promotes normal use of phosphorus and calcium in the body.

Rickets, resulting in permanent deformities of bones, bow legs, knock k n e e s, swollen joints, distorted ioints, pelvis, chest, and spine. Softened bones. Restlessness.

Not lost from foods in cooking and storage.



Aids normal reproduction in animals. Necessary for normal muscle atructure.

Lack of vigour. Low fertility. Impaired muscle functioning.

Little is known yet of the need or effect of vita-in E in the human body.

We are usually well supplied with this vitamin. is believed to be factor in preventing haemorrhage in new-born babies and in some surgical operations.



Helps clot blood, thus preventing or controlling haemorrhages.

Prolonged coagulation time of the blood.

BODY-BUILDING FOODS

They build the body and prevent the tissues from wearing out.

Milk — Cheese — Eggs — Meat — Fish Many vegetable foods, such as peas and beans, bread and potatoes also help.

ENERGY FOODS

Bacon and Ham—Bread—Butter or Margarine-Cheese-Dried Fruit-Dripping, Suet, and Lard — Honey—Oatmeal—Potatoes — Rice—Tapioca—Sago—Sugar.

PROTECTIVE FOODS They Protect Us from Disease.

- Butter or Margarine - Cheese -Eggs-Herrings-Salmon (tinned or fresh) -Liver.

Potatoes—Green Vegetables and Salads— Fruit (fresh or tinned)—Carrots—Toma-toes—Wholemeal Bread. Protective foods are needed if we are to be properly nourished. They build the teeth and bones, and help us to resist infection.

IMPROVISE YOUR OWN DEFENCE

COOKING - FOOD VALUES AND ECONOMY

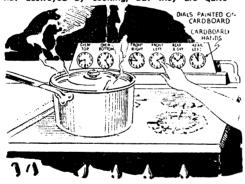
These notes are intended to give a little more information on a subject valuable, not only in war time, but for every day. It would always be a good idea when arranging meals to choose for every day something from each of the four groups shown on the previous page.

In addition to vitamins, there are certain mine-

In addition to vitamins, there are certain minerals in these foods which are also necessary, i.e., CALCIUM, which helps to build bones and teeth, promotes the healing of cuts and wounds, etc., and which assists the functioning of heart, nerve, and muscle. There is IRON, which is needed for normal growth and for the functioning of the thyroid gland; and there is also COPPER, IODINE, and PHOSPHORUS, all of which are necessary for one thing and another.

Unlike some of the vitamins these minerals are

Unlike some of the vitamins, these minerals are not destroyed by cooking, but they are quite



When you put the food on the stove just set the dia! to indicate time for removal

easily dissolved into the cooking water, and so may be wasted. Therefore avoid this as much as possible by cooking in a small amount of water, using a steamer where possible, and then save the cook-ing water for use in soups, gravies, and sauces. Vegetables cooked in "hard" water will lose fewer minerals than those cooked in "soft" water. Vegetables should be eaten as soon as possible

after picking, as some of them lose 60 to 70% of vitamin value in four or five days. A large part of the mineral content of vegeables is just under the skin, so peel them thinly, or, better still, cook them in their skin. Canned foods retain their mineral content.

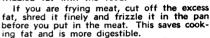
Outer leaves of areen vegetables contain more than pale vitamins leaves.

Vegetables should, if possible, be served the minute they are cooked—the vitamin content is boiled away by keeping hot on the stove. Quick freezing does not destroy the mineral con-

Fats are essential for health and strength. Even the wrappings in which butter, etc., is purchased should be scraped, and the paper itself used for greasing baking dishes,

Also, cut off the excess fat from your meat before cooking and shred it finely. It can then be used for many purposes, such as frizzling in the frying pan for frying tomatoes, potatoes, etc. Then serve the

tomatoes, potatoes, etc. frizzled fat with the food.

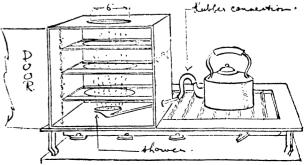


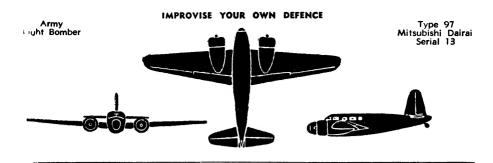
Cooked fat can be added to small amounts of water used for cooking vegetables, both green and root. It can also be put on top of both baked and grilled dishes or in savoury stuffings.

TWO NOVEL IDEAS

Apart from fuel saving and, in order to get the best value from foods, it is wise to cook by the clock, and therefore this little home-made idea will help in this respect. One can then see at a glance what time each particular jet was put on. They are just home-made cardboard clocks, each with two pointers for each burner, which can be set as each particular item is put on. Over-cooking means waste in food value and the goodness is then often poured away down the sink. Gas is wasted by letting the flames leap up the side of the pot or kettle.

To Save Fuel. If on occasions you do have to keep meals hot, a novel arrangement like this is quite a good idea. If living in the city, it will save gas, and, if it is a wood stove, it will need the minimum of attention. It is easily made. The shelves should be about 3 inches apart, and the arranged facing upwards for the steam. A little rubber tube and piping will complete.





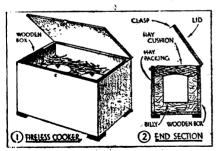
A FIRELESS COOKER

rou will be agreeably surprised by the pertermance and convenience of this excellent fueltering device. Food that is ordinarily cooked in the saucepan can be placed in the cooker after the contents of the saucepan have been thatled to boiling point by the usual means. Using this method, the foods to be cooked will cover burn, but it is necessary to allow three times the amount of time for cooking compared with a fire.

It may be possible to select a suitable box to the outside container, otherwise you will need to construct a box of suitable dimensions according to the number of billies or saucepans you will be suitable, and a box measuring approximately 15 in. x 15 in. x 15 in. x 16 in. high will be satisfactory for 3 lattles. Allow a 6 in. space all round each billy. The box should be made airtight by carefully fitted and held down with a clasp.

Put a good amount of clean dry hay on the testion of the box, and press it down to make it of 6 in layer. Give particular attention to the corners. Then select the billies you intend order in the cooker, stand them in position on the hay, and pack with hay in the form of wraving the spaces left between the billies. If succepans are used, bury the lower part of the bundle in the hay.

The next stage is to make a cloth bag of tractly the same measurements as the inner dimensions of the box. Fill the bag with hay



to make a cushion that will completely fill the pair left between the top of the billies and the hid of the box. It is important that there-bould be no air spaces left for the escape of total

When you take off the cushion and lift out the billies without disarranging the hay, the cooker will be ready for service. It is only necessary to bring the food to be cooked to the toll, and then transfer it, while still boiling, to the cooker, where the cooking process will be

HOME MADE REFRIGERATORS



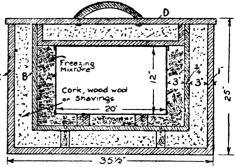
First, you can make use of the cooling effects of evaporation. Small objects, such as butter, can be kept cold by means of a flower-pot, a cloth, and a dish of water, as shown. The dish is filled with water, and an empty tin or block of wood is placed in the middle. A plate holding the butter is set on the block and a porous pot then inverted over the plate.

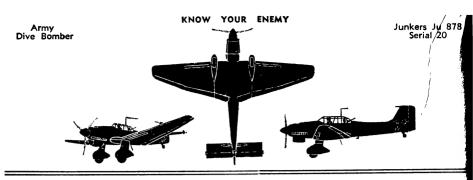
Then cover the above with a piece of loosely woven cloth, the edges of which dip into the water, and a hole is cut in the cloth just over the hole in the pot. The water soaks up into the cloth, and, in evaporating, cools the pot and its contents.

It is also a simple matter to make an ice-box or refrigerator for the home. Two boxes will be needed, one about 6 inches longer and wider than the other. The smaller one is put inside the larger and the space between them is packed with sawdust, powdered cork, wool, charcoal, or some other insulator. A thick insulated door is also provided.

Some cooling agent must be put in this box with the food, and, if no ice is available, a freezing mixture of equal parts of ammonium nitrate and water may be used. When the nitrate dissolves in the water, it has a very great cooling effect.

The freezing mixture is put in a tray at the top of the box. When the solution is complete and the cooling effect has stopped, the water may be evaporated and the nitrate recovered to be used over again. If the inner case is lined with zinc, and a zinc container is provided for the food, the freezing mixture may be placed between them with better effect. A section on view of such refrigerator is shown below.





HANDY HOME REPAIRS

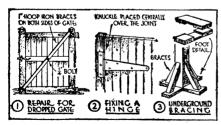
SIMPLE GATE REPAIRS

The motto "prevention is better than cure," is especially applicable to the maintenance of exterior features such as gates.

Time will be profitably spent if you periodically check up to see that all cracks are filled with putty, and all surfaces are well painted or oiled to prevent the entry of moisture into the joints with its resultant distortion and rot. Once a gate has dropped it is difficult to effect a permanent repair just by nailing, but a satisfactory solution to the problem will be found in the idea presented.

The gate should be taken off the post and laid on a flat surface, so that all joints can be knocked together and the gate squared up. Then you can stretch and bolt down a 1 in. strip of heavyweight galvanised hoop iron, diagonally from corner to corner on both sides of the gate. Fig. 1 shows the back view. It will be necessary to drill & in. holes about 1 in. from each end of the hoop iron and at a point where it crosses the centre rail, so that & in. bolts can be driven through the iron strip and the case to brace it through the iron strip and the gate to brace It rigidly. The nuts on the bolts, with washers underneath, should be placed on the inner side of the gate. If it is not practical to arrange an iron brace on each side of the gate, you should place 2 strips X-fashion on the inside surface

Fig. 2 shows the correct position for a Thinge on a gate. Stand the gate in its position with small blocks underneath to keep it the desired distance above the ground, and then you can screw on the hinges with the knuckle placed centrally over the space between the gate



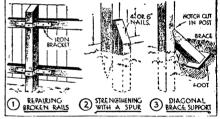
and the post. If a gate post is so decayed that it will not hold the hinge screws, the damaged part can be cut out with a chisel, and the recess filled in with a new piece of wood.

If it becomes necessary to replace a gate post, the construction for the bracing as shown in fig. 3 will be ideal for the resistance of strain in all directions. There is no need to smooth the surfaces, but the construction should be carefully carried out to make a strong job, when the braces are nailed in position on the post and the foot.

PUTTING YOUR FENCES IN ORDER

Fig. 1 shows a very simple but effective method of repairing a broken or rotted fencing rail. Bend a substantial piece of sheet iron to conform to the shape of the post, and then fix it on the rail and the post with a few screws. The iron should be painted to prevent it from

If a post rots off near the ground level there If a post rots off near the ground level there is no need to replace the post, as a repair can be easily effected by digging a hole at least 2 ft. deep at the back of the damaged post to take a spur. Redgum is the best wood for the purpose. Generally a 3 or 4 ft. x 4 in. x 3 in. spur, with a long tapered bevel, as shown in fig. 2, will be ideal. The bevel, as well as casting off rain, simplifies the driving of nails to make a secure job. You should use nails at least 4 in. in length, or, if you wish, bolts can replace the nails. After fixing the post and the



spur together, the hole can be gradually filled with earth, which is rammed down tightly round

with earth, which is rammed down fightly found the spur with a square-ended piece of wood, or else you can use concrete for the filling.

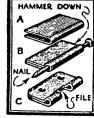
The diagonal brace of 4 in. x 3 in. redgum, footed with a wooden block (fig. 3), is very useful for supporting a post which persists in tilting over. The upper end should fit and be added to the persists in the process of the control of the process. nailed into a notch in the post some inches above the ground level, and the lower end should be sunk into the ground 15 in. or more away from the post.

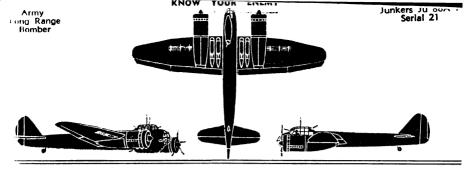
It is a wise precaution to coat all sunken timber with tar or creosote to resist decay.

MAKING AN EMERGENCY HINGE

Owing to damage for some reason or other, a hinge may be required urgently. This is a good way of making one. The various steps in its construction are clearly

Since each half of the hinge is made by doubling over a rectangular piece of metal, a strong is possible. second part of the hinge must, of course, be made to fit exactly the first part.





A QUICK REPAIR FOR WINDOW



Sometimes a pane of glass may become badly cracked but none of the glass knocked out, and, with a little attention quickly, the glass will be useful for quite a long time.

It can easily be fixed by using two buttons, one on each side, at the point where the cracks converge.

the buttons are then simply sewn together as howe in the accompanying illustration.

MENDING BROKEN PIPES

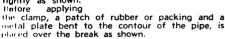
AUTO-HOSE

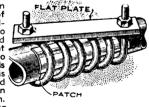
CLAMP

A water or other upper may become damaged and these sketches will show two good ways of effecting temporary repairs.

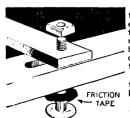


second consists of a spethe ends of rod. which are threadprevious to •d trending it around A flat the pipe. plate drilled to inceive the ends of the clamp, is provided and crewed down tightly as shown. Hefore applying





TIGHTENING A LOOSE NUT

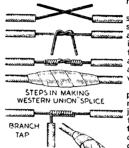


A piece of friction tape, cut as a washer, will save time in trying to tighten a nut on a round-head bolt, which might be difficult to keep from turning.

Just slip it under the head and it will hold it firmly and enable it to be drawn up tightly.

JOINTING AND SPLICING ELECTRICAL WIRES

These illustrations should be of help to any who might have occasion to joint or splice such things as electrical wires of any description. These might get cut or otherwise damaged at any time and a few hints might therefore be



helpful.

The first joint shown is an end splice for extending a wire. The second is the joint required for tapping a branch at right angles. Both are used in open wiring.

The third is the pig-tail joint commonly used in all junction boxes. At fixtures and in motor terminal boxes it is constantly ultilised in conduit and similar wiring. Approved solderless connectors may be used on pig-tail joints if preferred to solder and tape.

The ends of the wires must be scraped absolutely clean and far enough back

to allow enough turns to make a mechanically tight joint.

PIGTAIL

Solder and wrap tightly with both rubber and friction tapes. Loosely made joints, especially if left unsoldered, can become a fire hazard.

MENDING BREAKS IN PLASTERED WALLS

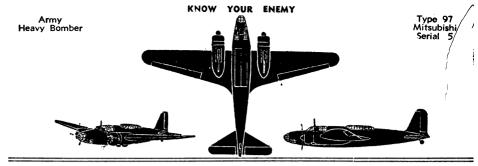
This is simple if the following procedure is adopted. If the break is small, remove the crumbled material and undercut the edge of the

firm plaster. If the break is any large and lathes are broken, remove the damaged plaster and cut away the broken Then lathes. under - cut the edges firm plaster and tack a piece of screen wire over the lathes. the Dampen edges of the plaster so that the patching material



bond to it thoroughly. If no regular patching plaster is available, a mixture of plaster of paris and water will do.

CUT AWAY BROKEN



WORKING WITH CEMENT

First of all, there are certain rules to be applied, i.e., correct too's, clean well-graded material, correct proportio ing, thorough mixing, using the right amount of water, placing the concrete immediately after mixing, ramming sufficiently and subsequent watering.

A good mixing platform is necessary in order to keep everything clean. A measuring box is also an essential so that will you be able to use the same measure all the time.

Mixing. These illustrations will show the order of mixing. First measure the required quantity of clean sand and spread evenly on to the mixing platform say about 4 in. deep (see fig. 1). Then spread the right amount of cement evenly over the above—don't guess at it.





Mix these two thoroughly by turning over with shovels until the colour is uniform (fig. 2). Streaks indicate that sand and cement have not been thoroughly mixed.

Then measure the coarse material, spread it on top, and repeat the mixing process until the colour is again uniform (fig. 3). Then form a depression or hollow in the centre (fig. 4). Mix whilst adding water until the mixture is a quaky, jelly-like consistency. Do not use too much water.

Water. It is essential that the correct amount be used. A good procedure is to add say about what is thought to be three-quarters of amount required, say about three-quarter gallon to each cubic foot of concrete, adding slowly and mixing all the time.

Forms and Moulds. These will be required and should be greased with either soft soap, linseed

oil or crude oil, etc., to prevent concrete sticking to forms. Forms should NOT be greased when it is intended to plaster the surface of the concrete, but should be thoroughly wetted down immediately before placing the mixture.

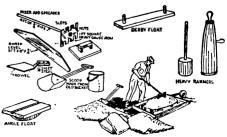
Home-made Tools. These can easily be made from scrap material and the following sketch

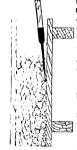




will give details of those required and how they can be fashioned. This shows a portable platform from an old wheelbarrow; but, of course, such a portable one is not essential. Ordinary mixing can be done with a shovel, but a good one can be improvised as shown. Wooden floats and sweep levels are necessary, and rammers are required.

Placing and Joining. The concrete should be placed in the required forms as soon as thoroughly mixed. Do not mix more than can be placed in one hour. Where concrete cannot be finished in one operation, the surface where it is to be joined should be left as rough as possible. Then, before operations are resumed,





the surface of the concrete al-ready set should be wetted and a 3 in. layer of 1:1 cement and sand mortar applied as the fresh supply of concrete is being joined up. Tamp the lot well.

joined up. Tamp the lot well.
Except when making floors,
concrete should be placed about
6 in. deep in the forms. Each
layer can then be thoroughly
tamped in order to expel air pockets.

Spading. This illustration shows how concrete should be well worked with a spade or wedged stick, so that the coarse material is forced a little back to allow mortar to flush in and form a smooth, even surface

Ram sufficiently to consolidate; the Ramming. temper the concrete the less ramming required. finishing. Should a fine finish be required, the mirete first laid down should not come quite to the top of the forms and should not come quite to the top of the forms and should not be smoothed the while the concrete is still green (within 1 hours of laying) a finishing coat of 1 part coment and either 2 or 3 parts sand should be applied and finished off with a wooden float.

Assaid excessive floating or trowelling. Curing. Keep work as damp as possible and to make a state that it should be cured by sprinkling and later covered with wet bags for 7 days or more.

Average Proportions for Various Purposes. The that figure given is the amount of cement impulred, the second figure represents the fine material, i.e. sand, and the third the coarse ociterial.

4 For ordinary average purposes; buildings, pavements, retaining walls, troughs, tennis courts, and tanks, certain foundations.

Where medium quality concrete is needr ed, such as most foundations, walls, sheds and unimportant large masses (except where ground is bad) when safer to use 1 2 4.

Gate and fencing posts.

This is good for topping, but for heavier wear (sheds, etc.), use 1 2. A little neat cement may be lightly dusted on surface.

time part cement, 2 much fine and 4 parts ' cubic feet of concrete, the fine only fills in the voids in the course 12"

material, and the cement fills in the voids in the "fine" sand. The volume of finished concrete is very little greater than that of the coarse material. The following table will give

MATERIALS REQUIRED FOR 1 CUBIC YARD OF CONCRETE (Average Conditions)

Pa	per Bag			Approx. Water
	of	Cub. ŕt.	Cub. Ft.	per Bag
Proportion	Cemen		Coarse	
1:2:3	6∄	14	20∄	41
1:2:4	5ž	12	24	5
1:2:5	5	104	261	5.3
1:24:5	43	124	243	6
1:3 :5	. 41	134	23	6‡

AREA WHICH CAN BE COVERED BY 1 CUBIC YARD OF CONCRETE (Calculated in Thickness of Inches)

Thickness ½" ¾" 1" 1½" 2" 3" 4" Area (Sq. Ft.) 648 432 324 216 162 108 81

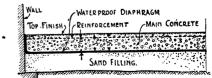
HOW TO LAY A BETTER CLASS CONCRETE FLOOR FOR VERANDAH OR INSIDE OF HOUSE

Firstly, make a good foundation of sand or good gritty material. Do not use clay and do not lay concrete on natural surface of ground.

Secondly, insert a damp proof course between this foundation and concrete with end turned up against wall. This also checks whiteness which sometimes appears.

Thirdly, use 1 : 2 : 4 mixture with up to $\frac{1}{2}$ in. and $\frac{3}{4}$ in. coarse material and lay about $2\frac{1}{2}$ in. of this. Screed off roughly and then lay some reinforcement (preferably special welded fabric), but wire or pig netting can be used. See that reinforcement does not bulge. Then tay the final ½ in. concrete to make it 3 in. thick.

Surface should be level but rough, and on same day, say in about 3 hours, the finishing coat should be put on. A good wearing coat is 1 of Cement, 2 of coarse Sand, and 2 of \(\frac{1}{2} \) in metal. Then screed over and level with a wooden



float. A mixture of 3 parts Cement and 1 part Red Oxide can then be dusted over evenly through a sieve and worked in with a wooden float, then allowed 2 or three hours for setting. It is then trowelled up hard without further dusting. If trowel brings up water, discontinue until water dries out, but do not add cement in order to dry. It should then be of good even colour, and for ultimate best results waxing or painting should not be done for 12 months. painting should not be done for 12 months.

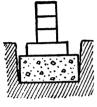
IMPROVISE YOUR OWN REPAIRS



BRICKLAYING FOR THE AMATEUR

To know how to lay a few bricks may be well worth while. To find out the number required, take measurement of walls in square

yards. It takes approx. 42 bricks to the square yard.



All brickwork should be supported by foundations-usually a concrete base and a brick course known as a footing. The bottom of the trench must be level and the surface of foundation likewise. To ensure this, numbers of pegs can be

driven into the sides of trench, and, with the aid of a straightedge and level, they can be fixed to show just where the top surface of concrete is to come. This is most important.

Mortar Mixture. Mix lime or cement with clean sand; the proportion of lime to sand being 1 and 3, and the heap of lime should be arranged in the centre of the ring of sand.

Fresh lime needs to be broken down from the lumpy state by means of slowly spraying water. Do not touch the lime during this process. When the lumps have changed to a creamy paste, it can be shovelled to make sure that it is pro-perly slaked. Then shovel sand over the lime and continue until both are mixed. Add more water if you think it necessary.

Tools Required. A shovel for turning the mortar mixture; a brick-layer's trowel; a plumb

I, 2. Line. Breaking Back

1 in this column), and a carpenter level (2), both easily made. A large piece timber (3) is useful for setting the work. A large piece of length of strong string is required; careful use 54

of string and plumb ensuring that the work

kept straight.

Laying the Bricks. The illustration given below will give a good idea as to how to hold the prick in setting so that the line on which the brick is being done, will not be disturbed. A skilful worker will not touch the line even when applying the mortar or laying the brick. Remember, that in laying bricks to a line, it is very easy to push the line out with the bricks.

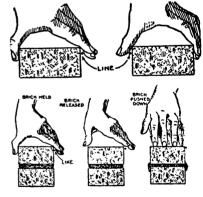
The sketches show how the brick is laid and pressed down (sometimes tapped down) until its

upper surface is level with the line.

1. The First Course is laid either with or without mortar.

2. Extreme care must be taken to put the first layer dead straight on the foundation. struct the corners first (fig. 4), then stretch ne. Then lay all bricks on the first the line. course, working from corner to centre, filling in with broken brick if necessary.

3. Gaps, ½ in. between bricks, well filled with mortar. Bricks should be well wetted before use. They should be laid with frog all facing



the one way-up or down-and tapped strongly into bed. Any excess mortar should be squeezed out and cut off.

The secret of good bricklaying is to erect the corners first about 4 bricks high, breaking back the joints (5) until the required height is obtained, carefully plumbing each edge and taking care to get each edge vertical.

When both corners are erected, the line is moved up to the second course, and the work proceeded with. If the corners are upright and the rest of the wall in dead straight line, the wall should be true and upright.

Keep the joints of the bricks neat and all of the same thickness; then the tops of the bricks should be level. For vertical joints, the bricks should be buttered with mortar, as in (7) before being placed hard up against its neighbour.

Bricks should be laid to a preconceived plan, otherwise the wall will lack cohesion or bond, and later on will probably develop trouble.



The most popular brick wall (because of its heapness and damp-resisting qualities) is what is known as the cavity brick wall—being composed of two 4½

FIG. I.

FIG. 2.

in. bricks with a inch gap in between.

Usually when a wall is this fashion it is described as longitudinal bond (as in figure 1). This makes a good strong wall of course, betrays that the wall is built as a shell, and is not solid brick.

For solid walls, there are two torms of bonding, (a., the English (fig. 2) and the Hemish (fig. 3). In both cases the ands of the brick appear.

It is generally said that the Eng-

high bond is used where strength is the chief factor and the Flemish where appearance counts the most

Plastering. To be plastered, the joint should be raked out roughly with the point of the trowel before the mortar sets.

REPAIRING LEAKS IN UNDERGROUND PIPES

If a pipe or drain which is land underground becomes damaged, it can quite easily Im repaired in the manner shown here.

After digging down to the pipe, a half tile is placed under it and the pipe is wrapped with a couple of layers of tape to cover the bále.



some sheet metal or galvanised iron is then bent around the pipe to give a 1-inch clear-nice all around and to provide a form. Dirt to then banked at both ends of the form, after which junk babbitt and lead is poured around the pipe.

AN IMPROVISED LEVEL. There may be occa-sions in which you may



level or plumb bob, and this little idea might idea might therefore help.

have something damaged or some work to do

require a

which may

face upon which the lower arm of the square is resting will be level. You can see that if the bottom of the square is not level, the bob will not hang truly.

NOVEL IDEA TO CLEAR A WASTE PIPE.

If such a thing as the kitchen sink becomes stopped up, or perhaps the bathroom or lavatory is out of order

for the same reason, you may not be able to obtain the services of a plumber, but you can effect quite a good job by the use of a motor pump.

Take inner tube which

still has the valve intact. Cut from this a circle around the stem, leaving two or three inches of rubber on all sides.

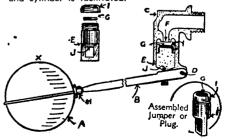
Wet the rubber and hold it firmly over the drain while serve other member of the family

drain while some other member of the family applies the pump.

The same idea can be applied to other jobs where there is any stoppage in pipes or such

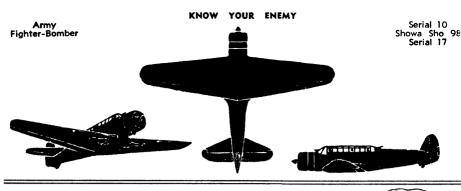
REPAIRING A FLUSHING CISTERN.

few hints on adjustments may be useful. If the ball valve which controls the supply of water to the overhead tank is sticking, it may be due to the copper float scraping on the sides of the cistern, or on other portions of the flushon the cistern, or on other portions of the flushing mechanism, or it may be that the plug "E" is not sliding freely in its cylinder. If the ball float is not able to fall, the cistern will empty and will not refill, whilst, if the ball float falls and cannot rise freely, the water will continue to flow into the cistern until the float rises. The riow into the cistern until the float rises. The stem of the float is a soft brass rod, and, by bending this slightly downwards, the flow of water can be cut off when it reaches any desired level in the cistern. By removing the pin "D," it will be possible to take out the ball and arm, so that examination of the plug and cylinder is facilitated.



clamp to the vertical arm of a square and attach of a splumb bob as shown.

Then the distance between the string and the string arm is equal top and bottom, the sur-

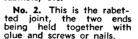


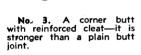
WOODEN JOINTS AND HOW TO MAKE THEM.

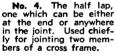
In case of damage to various articles round the home or if any amateur carpenter wishes to do any work for himself, in these times of labour shortage, the following details might be of use:—



No. 1. This is the butt joint which is the simplest to make. It is used in making boxes, small wall cabinets, etc.

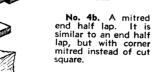


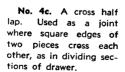






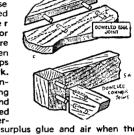
No. 4a. This is a half lap slice—to join the ends of two straight or curved pieces, in order to lengthen.





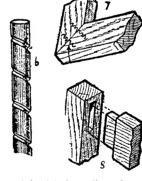


No. 5 and 5a. These are called dowelled edge and corner joints. It is used for jointing two or more narrow boards when making table tops and fine cabinet work. The dowels are centred lengthwise along a gauge line, and they are flattened very slightly to permit the escape of sur



mit the escape of surplus glue and air when the dowels are driven home.

No. 6. This is a spiral groove which is very useful for dowels. This admits glue to portions which would perhaps be bare. It forms a channel for the escape of air.

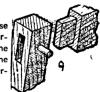


No. 7. A mitre joint with corrugated fasteners. A quick method of joining wood together for corners or cross - bars. Draw the parts together tightly and drive the fastener a cross the edges.

No. 8. This is a housed mortise and tenon. It is

used for jointing rails to legs and posts.

No. 9. A pinned mortise and tenon for the same purpose—this method is the more often used to hold the lower rail to the leg in certain styles of furniture.



No. 10. A bevelled corner joint with clamp rail. This makes a quick joint. It is driven into a saw made cut made on the two parts—it also draws the parts together as it is driven in.

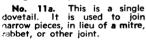




Wooden Joints and How to Make Them (contd.)

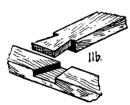


No. 11. These are dovetail joints. To the amateur, this is the attainment of real skill. "A" shows the correct form of joint. "B" may be easily split, because of the sharp angles. Further, as the strength of the dovetail joint depends upon the pins, "D" with only one tail is not nearly so strong as "C". A dovetail is used where extra strength is required.









No. 11b. This is called a dovetail half lap and its construction is self-explanatory.



No. 12. This is termed the Dado joint. It is used a lot in building shelves, etc.

No. 12a. This is the stopped Dado. It is used where it is desired to conceal the groove from the front.









No. 12c. This is the end Dado, or in other words the Box Corner. It is rather a strong joint. No. 12d. A rabetted and grooved drawer front.

WAR TIME FURNITURE

If, in these times of restricted purchasing you have occasion to provide some extra piece of furniture it may be possible to make some up from any good strong packing cases or other timber which might be available.

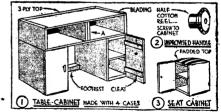
The illustration given shows one very handy type of utility furniture which costs almost nothing to construct. Such a thing may be useful for a variety of purposes, and at the same time have quite a good general appearance.

Constructed with 4 kerosene cases, it can be used as a desk, especially for the children's room, a work-table, a cupboard for storing various articles or even a dressing table, and, if the parts are put together with some care, the appearance will be all that is desired.

Fig. 1 shows how the cases should be arranged. irst join together the 2 horizontally placed cases with 2 in. nails, 1½ in. screws or 1½ in. bolts. If nails are used they should pass through both thicknesses of the ends, and the points should be bent over and clinched.

Then you can place this top portion on to the 2 upright cases as shown in Fig. 1, and nails, screws, or bolts can be used to hold these parts together. The lids from the 2 upright cases can be utilised for doors by attaching them to the boxes with metal hinges, or else you can tack thin leather strips to the doors and the cases to serve as hinges. It is advisable to nail 2 cleats across the inside of each door to prevent warping and splitting. Although handles can be purchased, you can easily make your own by cutting a cotton reel in half (Fig. 2) after which one part is screwed on to each door.

The footrest (Fig. 1), which is nailed between the bottoms of the boxes, strengthens the construction. If you wish shelves can be fitted in



the boxes, a piece of 3-ply cardboard, or oilcloth can be tacked on to the top surface and strips of wooden beading can be nailed on to the 3 edges, as illustrated.

The example can be stained or painted in the way you choose, or else the surface can be covered with cretonne.

Fig. 3 shows an appropriate design for a padded seat to use with this table cabinet.

Quite a number of articles can be made on the same principles as those given above, all of which should serve a good purpose for the time being.

RECLAIMING USED MOTOR OIL



From the point of view of economy of oil, the following is one way in which some have successfully reclaimed old motor oil for other purposes. The oil will come out quite clear and free of carbon and other foreign particles and will be useful for quite a number of things.

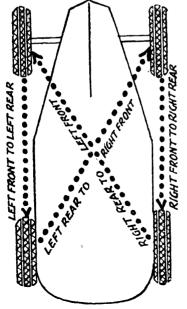
Just put the used oil in a container on a shelf, box or table. Then hang a rope over the edge of the container with one end in the oil and the other in a second container underneath. A

spring or coiled wire over the rope where it contacts the edge of the upper container will keep it in place.

Capillary action will cause the oil to rise in the rope and run down into the lower container.

SAVING TYRE WEAR BY ROTATING THEM Rotation of tyres every 2,500 to 3,000 miles will give longer life and the following method has been proved to even up tread wear and increase the average mileage.

The front tyres are moved straight back to the rear while the rear ones are moved diagonally. Tyres should be re-applied so that the same side of the tyres will face outwards as before.



SERVICING YOUR OWN TOOLS

Many tools that are frequently discarded in normal times can be brought back into service to take the place of tools that are now hard to buy.

Hacksaw blades mounted in handles can be sharpened to take the place of knives and small

Hacksaw blades mounted in handles can be sharpened to take the place of knives and small scrapers. The metal will take on a very sharp edge, and it will retain its keen edge for a long time.

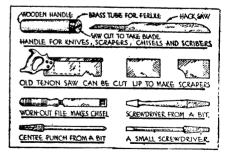
A broken tenon saw can be cut up to form excellent wood scrapers. It will be necessary to take off the saw handle and brass backing, and then the desired shape for the scraper can be scored with the sharp edge of a good file and broken off. When breaking the metal it is advisable to hold a straight edge on the score, and to place a piece of thick cloth over the metal to prevent splinters flying.

An old file makes a good chisel when it is set in a handle, and wood or metal bits or drills can be converted into screwdrivers, centrepunches, small cold chisels, and nail punches.

All these various shapes can be roughed out on an emery wheel, after which they should be finished on an oilstone. Putty knives and small scrapers can be made from old knives.

A spanner to fit special nuts can be easily made with a $\frac{1}{8}$ in. bar of steel. Drill a hole in the desired spot away from the end of the iron bar, and then file the hole to conform to the exact shape of the nut.

Sometimes it is advisable to soften or anneal the metal before attempting to shape it, and in the case of steel this can be done by heating the



metal over a gas fire or a coal fire to a dull red colour, and then allowing the metal to cool slowly.

After grinding or filing to shape, the steel can be hardened by heating the desired portion to a bright red, and then quenching it in clean cold water for a few seconds. Then you should polish the tip with emery paper to enable the change of colour to be seen, when it is gradually heated a second time. The moment it takes on a light yellow colour plunge the steel in cold water, and swirl it in the water until cold. This process will temper the steel, and enable it to retain its intended form.

USEFUL IMPROVISED LIGHTS FOR TRENCH OR SHED

The first is a candle which will safely put itself out at any estimated time-it is just forced into a hole in the tin and, as soon as it burns down to the cover, it drops into tin, which is half filled with water.

No. 2 is a tin cut to shape. which acts as a reflector and a protector for the flame.



It also prevents candlegrease from being dropped all over the place. It can be cut from any tin to any size.



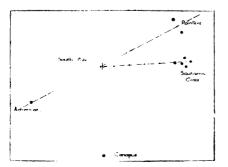
No. 3 shows how a piece of candle can be stuck in the side of a trench or anywhere out of harm's way.

HOW TO FIND THE SOUTH BY NIGHT

There are several ways, of finding the South by the aid of the stars shown in this illustration:-

- :1) They form a rough semicircle, the centre of which is the South Pole.
- (2) It is also the centre of a line drawn from Achernar to midway between the two pointers.
- (3) It is found by extending the long axis of the Southern Cross as indicated 4½ times from the lowest star on the Cross.
- (4) It is also at the intersection of the lines drawn for the previous two methods (see sketch).

not mistake the Southern Cross-the two pointers are always near and in the same position.



A USEFUL METHOD OF OBTAINING DIRECTION

If meticulous care is not necessary. simple but effective way of ascertaining the North can be had by holding a watch horizontally in front of one and then turning it so that the numerals denoting 12 o'clock are pointing directly at the sun.

is North the indicated direction by an imaginary line drawn from the centre of the centre of the watch to midway between 12 o'clock and the hour hand.

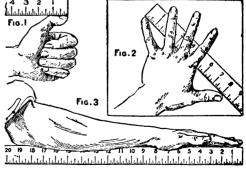


MEASURING WITHOUT A RULE
At a pinch, the hands, feet, and arms can be used as a measuring stick for making measurements that will be found surprisingly accurate in cases where absolute accuracy is not essential.

This illustration shows how the thumb (figure

1), the outstretched hand (figure 2), and the forearm (figure 3) can be used.

It is quite a good idea to take these measurements of yourself and either memorise or put ments of yourself and either memorise or put them up in a position in the workshop where it can be seen at a moment. It will be found useful on many occasions. The average thumb is about 1½ in., the average span 8 in. to 9 in. and the forearm to fingertip 20 in.



Further, the average "pace" or step will be found to be about 3 ft., although this, of course, is subject to variation according to stature.

TAKING MEASUREMENTS WITH COINS

Coins may be used in emergencies for taking measurements, for one halfpenny is 1 in. in diameter, a penny is 1-16th in. thick and 1-10 ft. in diameter, the **meter of a sixpence is ** in., and a half-crown \longrightarrow 1½ in. in diameter.

SUGGESTIONS ON PRESERVATION OF CLOTHES

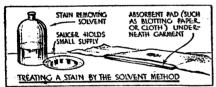
REMOVING STAINS FROM FABRICS

It is an easy matter to remove stains from fabrics if you resort to correct methods and use the proper solvents and chemicals. A knowledge

of the various methods may save garments that otherwise would be laid aside.

The first consideration is to know the type of stain which affects the particular material. Sometimes this will require investigation. Stains generally can be treated in one of three ways; that is, by a solvent, a chemical, or the absorption method.

Using the solvent method, the stain is washed out of the fabric by a liquid that will dissolve the stain, while a piece of blotting paper or ab-



sorbent material is held underneath. Petrol, benzol, carbon tetrachloride, amyl acetate, turpentine, and methylated spirit are some of the common solvents.

Always work in a well ventilated room, and, above all, keep away from a fire or naked light of any kind. The solvent should be applied sparor any kind. The solvent should be applied sparingly with a clean cloth while rubbing in one direction only, and you should work from the outside of the stain in towards its centre. If a ring or a clean spot is left after the stain removal, only careful blending around the edges will make the area less estimates.

will make the area less noticeable.

The chemical method means that the stain is bleached out with a chemical, after which the area treated must be washed thoroughly with water. Care must be taken to prevent the removal of dyes from the garment, but usually a test can be made on the inner part of the hem.

The use of water may debar certain materials from being treated by this method. Such stains as coffee, tea, ink, mildew, and fruit come under this method.

A good bleach can be prepared by dissolving in an earthenware bowl 2 oz. of washing soda in ½ pint of warm water, and then in another bowl dissolve 1 oz. of chlorinated lime in ½ pint of cold water. Allow both solutions to stand for 24 hours, pour off the clear liquid from both into a suitable bortle, label the bottle, and store in a dark place. This mixture is sometimes called javelle water.

The third method is that of absorption for the removal of oil and grease spots. Any fine powder, such as magnesium carbonate, whiting, talc, or even warm bran, which has the property of absorption, can be used. The powder is spread and left on the spot long enough to absorb the oily substance, after which the powder should be brushed off, and the area inspected in case another application is needed.

SPECIALISED TREATMENT OF STAINS

The accidental staining of fabrics is annoying, but usually the antidote is simple, and prompt action and intelligent use of the correct removing

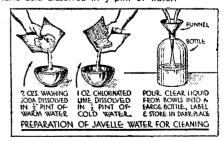
agent is important for successful treatment.
Remember that certain stains, such as fruit, blood, meat juice, milk, and egg, become "fixed" if subject to very hot water, therefore they should be treated with cold or tepid water before being laundered.

Before resorting to the wet method for the removal of greases on coloured or delicate fabrics, removal of greases on coloured or delicate tabrics, consider using the dry or absorption method, which was described previously. Be most careful in the use of javelle water, oxalic acid, ammonia, and acids on coloured fabrics, as they are likely to remove the dye, but they are quite safe for use on white cotton, linen, and rayon materials if the materials are thoroughly washed out immediately after application. Peroxide of hydrogen diately after application. Peroxide of hydrogen should be neutralised with ammonia magnesia, or borax before use.

Blood.—Remove with cold water and ammonia. Coffee.—Immediately after spilling, use warm water and soap. If set, use javelle water, and wash thoroughly with cold water, or damp with cold water, sponge with cloudy ammonia, and wash thoroughly. For woollens, rub with glycerine and wash as usual.

Dye.—Moisten the stain with kerosene and spread in sun; repeat till stain disappears. For white materials use javelle water.

Fruit.—Use javelle water and wash thoroughly with cold water for linen, cotton, and rayon, or immediately apply damp salt, and wash out with lukewarm water. On silk or wool use 2 oz. tartaric acid dissolved in ½ pint of water.

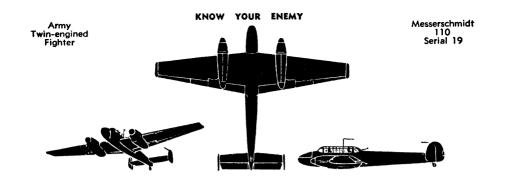


Grease.—French chalk or whiting spread over the spot and pressed with hot iron, or dab with a pad soaked in petrol (not leaded or coloured). Hold absorbent material underneath.

Ink.—Cover spot with salt, rub with lemon juice, lay in sun and rinse with cold water, or treat with \(\frac{1}{2}\) oz. oxalic acid in 8 oz. water; then apply javelle water and wash thoroughly.

Indelible Pencil.-Methylated spirit, then wash with soap and water.

lodine.--Photographic hypo, or rub on methylated spirit or alcohol, rinse in soapy water, then clean water.



REMOVING COMMON STAINS FROM CLOTHES

The removal of stains from articles of clothing will probably save them for future use, and to help in this respect another tabulated list of common stains, and their treatment, is given below:—

Mildew.— Wet stain with javelle water (see a previous section) for cotton, linen, and rayon. Wash thoroughly. On silk or wool use 2 oz. tartaric acid dissolved in ½ pint of water.

Milk.—Wash out with cold water if wet, or ether if dry.

Paint.—For fresh paint use a pad fully charged with turpentine, while an absorbent pad is held underneath; then sponge with hot water and soap. For old dried paint, soak stain in a mixture of equal parts of turpentine and ammonia, and wash out with warm water and soap.

out with warm water and soap.

Perspiration. - Soak stain in cold water, wash with borax, and expose to sunlight, or use soapy



water and peroxide of hydrogen. Also one part of javelle water to four parts of hot water can be used. In every case wash out thoroughly after chemical application.

Rust.—For white materials moisten salt with temon juice, and rub mixture on stain. Hold the stained portion over the steam from a kettle, and then rime thoroughly. Repeat if necessary, or else use javelle water on white cotton, linen, or rayon, and wash thoroughly. For coloured fabrics boil 1 cup of rice in 1 pint of water for half an hour. After standing for 12 hours, pour off liquid, and allow the stained part of the material to book in the liquid for about four hours. Rinse thoroughly.

Scorch.—For delicate fabrics apply a paste of magnesia and peroxide of hydrogen, and allow to dry. Scorch disappears when magnesia is brushed off. For white materials apply a paste of salt and lemon pince, hold over the steam from a kettle, and ringe thoroughly. Repeat several times if necessary.

Shoe Polish. Use benzol.

Tar.—Use quealyptus, and then wash with hot water and soop.

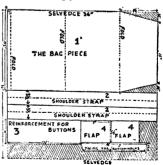
Tea.—For tresh stains of tea and milk wash out with cold water and soap, but for "set" stains on white cotton, linen, and rayon use javelle water and wash thoroughly. For fast-coloured fabric soak stain in methylated spirit, spread fabric on table, and rub in cold soap solution to make a good lather. Dry then wash as usual.

Tobacco.—Rub with petrol, and then a mixture of peroxide of hydrogen and ammonia. Rinse out thoroughly with water.

EVACUATION KNAPSACK

Requirements for the regulation evacuation knapsack are:—One yard of material, 36 in. wide, should be durable and light; 4 strong buttons, approximately 1 in. diameter; buttonhole twist or coarse cotton; sewing cotton. Instructions: To cut out, cut a spattern from measurements shown on diagram. The pattern consists of five pieces (turnings have been allowed):—(1) The bag piece, 36 in. x $19\frac{1}{2}$ in.; (2) shoulder straps, cut two, 36 in. x $19\frac{1}{2}$ in.; (3) reinforcements for buttons, 6 in. x $17\frac{1}{2}$ in.; (4) flaps, cut two, 7 in. x $5\frac{1}{2}$ in.; (5) facing for buttonholes, 16 in. x 2 in. Place pattern on material as shown, and cut out.

To make up:—(1) Turn a ‡ in. hem on AB and machine. (2) Turn ‡ in. hems on both edges CD and machine. (3) Place facing on right side of bag piece with edge EF along edge DD (centres together), and machine near edge. Turn in other edges of facing, fold on to wrong side of bag piece, and machine. (4) Turn a ‡ in. fold on all sides of reinforcement, tack in position on wrong side of bag piece as shown on diagram and machine round. (5) Fold shoulder strap pieces in half 'engthways (wrong side out), machine, and turn right side out. Strengthen them by zig-zag machining, as shown on diagram. (6) Attach shoulder straps to the right side of the back of the bag piece in position shown, overlapping the ends of the straps 1 in. Stitch strongly. (7) Fold AB over to





CC with the wrong side of the bag out, and machine a $\frac{1}{2}$ in. seam on either side. Press a crease along the bottom fold. (8) Square each bottom corner of bag as in a brown-paper bag. That is, press open each side seam, and allow it to lie along the crease at the bottom of the bag, thus

(Continued on Page 63.)

IMPROVING YOUR VEGETABLE PLOT

Protect plants with a windbreak if possible

Plant vegetable rows North and South to ensure proper sunlight

Use 2-2's tons of stable

Keep a compost hea

menure on a plot this

beside plot

Much publicity has been given to the necessity of home gardening of vegetables and many en-quiries have been made such as how much land is needed to produce sufficient vegetables for a family of, say, five, for a year; what is the most suitable soil to cultivate, is it necessary to trench the ground and what manuring is essential, etc.? Perhaps the following general notes may help to

answer these and some other questions that might be uppermost. It might take something like & acre of well prepared average loamy

ground to provide fully for a family of five. It is wasteful to attempt to grow vegetables on unprepared soil A good sandy loam is most suitable, but excellent results may be expected also

from clay loam and fairly light sand. The land must be in a satisfactory chemical and physical condition.

The top soil is the part that maintains plant life, so when digging, care should be taken to see that the sub-soil is kept at its right level. Good drainage is essential to the best results. Trenching is advisable for some plots, but expert advice should be taken, having regard to the particular plot before trenching is undertaken. Remember that good drainage helps to aerate the land and to keep it warm. Some soils are close in texture and need breaking up by working in ash, sand, and lime; these and also very poor lands needing

the maximum of manure, are usually improved by trenching.

After all clods have been broken up and the time for planting approaches, the will should be raked over till it is in a fine tilth and the worker level. Stable manure is first class. It supplies phosphorous, potash, nitrogen, and humma You would not go wrong by using as much as 7 to 2½ tons on a lot of acre.

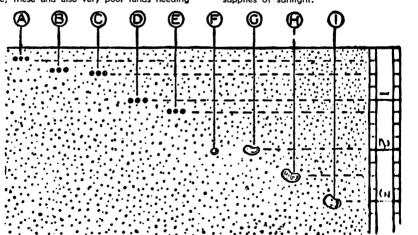
The manure is best 1/11 be

well rotted. It is advisable to have a compute heap along-side the vectorable plot. This can be made of layers of manure and will to which waste can lim aililed from time to time compost heap almulil be turned over occasionally can be drawn upon for

manure when needed. A little lime added to the

Compost heap would be an advantage.

Most soils around Adelaide wolkome a liming during the preparation stage. Notice how heet grows in your neighbourhoods; if it grows particular Notice how best larly well the chances are the soil monds little of no liming. Wood ash is useful where the soil is too acid. Watering is most advantageous if undertaken in the early evening. Soils should be stirred in the morning preferably. A whol brank of some sort is desirable. Vegetable tows and best running north and south provided the lay of the land permits, because both sides then unt equal supplies of sunlight.



DEPTH (in inches) AT WHICH VEGETABLE SEEDS SHOULD BE SOWN

The following sketch should be useful to the amateur gardener; it being intended to convey an idea as to the various depths at which various seeds should be sown—the inch measure being shown on the right hand side of the illustration.

(A) Lettuce and Onion. (A) (A) bage, Cauliflower, Brussel Sprout, Hadish, Lurnip Parsley and Parsnip. rsnip. (D) hillingly and Boot (F) Peas, (G) Francis Boons (E) Asparagus. (H) Runner Beans. (I) Broad Heath POIATOE: should be planted 4 to 5 inchine clarge